

Efficacy Of Maha Agad In The Management Of Dushi Visha Janya Artava Kshaya (Polycystic Ovarian Syndrome): A Clinical And Pharmacological Investigation



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Abstract

The maintenance of a rhythmic and healthy menstrual cycle serves as a foundational pillar for the physiological, psychological, and reproductive well-being of women, acting as a critical determinant for the health of future generations. Polycystic Ovarian Syndrome (PCOS) has emerged as a pervasive, multi-factorial endocrine disorder affecting women globally, characterized by a complex interplay of hormonal imbalances and metabolic dysfunctions. Historically identified through the Stein-Leventhal triad comprising oligomenorrhea, hirsutism, and obesity contemporary diagnostic frameworks such as the Rotterdam criteria (2003) now define the syndrome through the presence of at least two of three markers: oligo-ovulation or anovulation, clinical or biochemical hyperandrogenism, and polycystic ovarian morphology observed via ultrasonography.

From an Ayurvedic perspective, while PCOS is not described as a singular disease entity in classical texts, its clinical manifestations align closely with the pathological state of *Artava Kshaya*. This condition involves a deficiency in both the quality and quantity of *Artava* (menstrual blood and ovum), often resulting from the chronic accumulation of latent toxins, termed *Dushi Visha*. The current clinical investigation evaluates the efficacy of *Maha Agad*, a classical polyherbal formulation, in rectifying the underlying toxic pathology and restoring reproductive equilibrium in patients suffering from *Dushi Visha Janya Artava Kshaya*.

Keywords: Ayurveda, PCOS, *Dushi Visha Janya Artava Kshaya*, Ayurveda, Agadtantra, Infertility

1. Introduction

1.1. Pathogenesis of *Artava Kshaya* and the Role of *Dushi Visha*

The term *Artava* in Ayurvedic medicine encompasses a dual meaning: *Bahirpushpa*, referring to the menstrual discharge, and *Antahpushpa*, representing the ovum essential for conception. Healthy *Artava* is essential for the *Shodhana* (cleansing) of the female reproductive tract and the successful initiation of embryonic development. According to Acharya Charaka, the purity of *Shukra* (semen), *Artava*, and the *Garbhashaya* (uterus) are the three non-negotiable prerequisites for progeny. Conversely, *Mithya Ahara* (improper diet) and *Vihara* (unwholesome lifestyle) lead to the vitiation of these factors, culminating in gynecological disorders known as *Yonivyapada*.

Dushi Visha represents a unique toxicological concept within *Agada Tantra*. It is defined as a poison—whether of plant (*Sthavara*), animal (*Jangama*), or artificial (*Kritrima*) origin—that has not been completely eliminated from the body or

has become attenuated in its potency due to partial detoxification or the passage of time. Due to its low-grade nature, it remains dormant within the tissues (*Dhatus*) for years, shielded by *Kapha Dosha* and obstructed by *Srotorodha*. Under favorable triggers such as seasonal changes (*Kala*), dietary indiscretion (*Ahara*), or day sleep (*Diwaswapna*), this latent toxin flares up, causing chronic systemic disturbances. A hallmark clinical symptom of *Dushi Visha* is described in the *Sushruta Samhita* as *Kshapayet Shukram*, meaning the depletion of reproductive tissues, which directly translates to the manifestation of *Artava Kshaya* in females.¹

1.2. Correlation Between *Artava Kshaya* and Polycystic Ovarian Syndrome

The clinical profile of *Artava Kshaya* described by Acharya Sushruta includes *Yathochitakala Adarhsanam* (absence or delay in menstruation), *Alpata* (scanty flow), and *Yoni Vedana* (pelvic or vaginal pain). These features mirror the menstrual irregularities and chronic pelvic discomfort often

reported by women with PCOS. Furthermore, the chronic, relapsing nature of PCOS and its strong association with metabolic syndromes—such as insulin resistance and dyslipidemia—align with the systemic impact of *Dushi Visha* on *Rasa* and *Rakta Dhatu*.

In the modern context, PCOS is driven by a disruption in the Hypothalamus-Pituitary-Ovarian (HPO) axis, leading to elevated Luteinizing Hormone (LH) secretion and suppressed Follicle-Stimulating Hormone (FSH) levels. This imbalance prevents follicular maturation, resulting in multiple atretic follicles that form the characteristic "string of pearls" appearance on ultrasound. This pathological process can be interpreted through Ayurveda as *Srotorodha* (obstruction of channels) in the *Artavavaha Srotas*, primarily caused by vitiated *Kapha* and *Meda* (fatty tissue), which hinders the movement governed by *Apana Vayu*.ⁱⁱ

1.3. Limitations of Conventional Management and Rationale for the Study

Current conventional management for PCOS predominantly relies on symptomatic intervention using hormonal contraceptives, insulin sensitizers (e.g., Metformin), and anti-androgens. While these interventions provide temporary relief and address metabolic issues, they often involve long-term dependency and potential adverse effects such as gastrointestinal distress, weight gain, and teratogenic risks. Moreover, conventional therapy frequently neglects the root cause of systemic toxicity and metabolic sluggishness (*Agnimandya*).ⁱⁱⁱ Ayurveda emphasizes *Nidana Parivarjana* (elimination of causative factors) and *Samprapti Vighatana* (breaking the pathogenesis) through detoxification and restorative therapies. *Maha Agad*, a formulation mentioned in the *Ashtanga Sangraha Uttarsthana* for the treatment of various poisons, contains potent *Vishaghna* (anti-toxic), *Deepana-Pachana* (digestive and metabolic stimulants), and *Srotoshodhana* (channel-cleansing) ingredients. This study serves to scientifically validate the role of *Maha Agad* in mitigating the "latent toxic load" (*Dushi Visha*) that contributes to the endocrine and metabolic dysfunction of PCOS.

2. Conceptual Review

2.1. Historical Evolution of *Artava Kshaya*

The understanding of menstrual disorders has evolved through various eras of Ayurvedic history. In the *Vedic Kala* (5000 B.C.), while *Artava Kshaya* was not mentioned by name, conditions such as *Vandhyatva* (infertility) and remedies for *Ashubha Rajodarshana* (inauspicious or irregular menstruation) were detailed in the *Atharvaveda*. During the *Samhita Kala* (800 B.C. – 600 A.D.),

Acharya Charaka categorized gynecological disorders under the twenty types of *Yonivyapad*, where the concept of *Sapraja* and *Apraja Vandhyatva* mirrored the patterns of primary and secondary infertility seen in modern PCOS.

Acharya Sushruta provided the most definitive description of *Artava Kshaya* in the *Sutra Sthana*, linking its treatment to the use of *Agneya Dravyas* (substances with fiery properties). In the *Madhya Kala* (700 A.D. – 1900 A.D.), texts like the *Sharngadhara Samhita* and *Bhavaprakasha* reinforced the role of *Rasa Dhatu* in the formation of *Artava*, emphasizing that any disturbance in digestion (*Agni*) leads to a deficiency in the *Upadhatu Artava*. The *Adhunika Kala* has since refined this understanding through the identification of the HPO axis and the morphological characterization of polycystic ovaries.

2.2. Anatomy and Physiology of the Female Reproductive System in Ayurveda

Ayurveda conceptualizes the reproductive system through the *Artavavaha Srotas*, with its *Moolasthanas* (roots) located in the *Garbhashaya* (uterus) and *Artavavahi Dhamani* (ovarian and uterine arteries). Dysfunction in these channels results in *Vandhyatva*, *Maithuna Asahishnuta* (dyspareunia), and *Artava Nasha* (amenorrhea). The ovary, though not named explicitly as a single organ, is referred to through terms like *Beejakosha* (the sac of seeds) and *Antar-phala*.^{iv}

The physiological cycle, or *Artava Chakra*, is divided into three distinct phases:

1. **Rajasrava Kala:** The period of active menstruation (3–7 days), dominated by *Vata Dosha* and the action of *Apana Vayu*.
2. **Ritu Kala:** The proliferative or fertile phase (approx. 12–16 days), dominated by *Kapha Dosha*, characterized by the development of the *Stree-Beeja* (ovum).
3. **Rituvyatita Kala:** The secretory phase, governed by *Pitta Dosha*, during which the uterus prepares for potential implantation.

In PCOS, the *Ritu Kala* is pathologically extended or arrested due to *Kaphavrita Vata*, where the heavy, stagnant nature of *Kapha* prevents the *Vata*-driven release of the ovum, leading to the formation of multiple cysts (follicular arrest).^v

2.3. *Dushi Visha* as a Contemporary Pathological Catalyst

The relevance of *Dushi Visha* in the 21st century is increasingly evident in the context of environmental toxicology. Modern pollutants, including bisphenol A (BPA), phthalates, and organochlorine pesticides, act as endocrine-disrupting chemicals (EDCs). These substances are lipophilic and bio-accumulative,

meaning they settle in the *Meda Dhatu* (adipose tissue) and remain latent for long periods, mimicking the classical description of *Dushi Visha*. Clinical studies have confirmed that women with PCOS often exhibit higher serum levels of BPA, which impairs androgen metabolism and exacerbates insulin resistance. Thus, the management of PCOS requires an *Agada* (anti-toxic) approach to clear these "modern latent poisons" from the systemic circulation.^{vi}

3. Materials and Methods

3.1. Clinical Trial Protocol and Ethics

The research was designed as a single-arm, exploratory clinical trial involving 30 patients. The study was approved by the Institutional Ethics Committee (IEC No.- DSRRAU/PGIA/IEC/22-23/650) and registered with the Clinical Trials Registry-India (CTRI/2024/08/071834). A 60-day intervention period was established to assess the transition in both subjective and objective health markers.

3.2. Participant Selection Criteria

Participants were recruited from the OPD and IPD of the Post Graduate Institute of Ayurved, Jodhpur.

3.2.1. Inclusion Criteria

- Women aged 18–40 years diagnosed with PCOS via Rotterdam Criteria.

- Clinical presentation of *Artava Kshaya* (scanty, delayed, or painful periods).
- Willingness to adhere to the trial protocol and provide written consent.

3.2.2. Exclusion Criteria

- Presence of adrenal or ovarian malignancies.
- Concurrent use of metformin, corticosteroids, or oral contraceptives.
- Systemic illnesses like uncontrolled diabetes or renal failure.
- Pregnancy or lactation.

3.3. Pharmaceutical Preparation of *Maha Agad*

The trial drug, *Maha Agad*, was prepared in the university's *Rasayanashala*. The roots and rhizomes of the primary herbs were cleaned, dried, and pulverized into a fine powder (*Churna*). Following the reference from *Ashtanga Sangraha*, the mixture was triturated with *Basta Mutra* (goat urine). Trituration (*Mardana*) was continued until the mixture attained a *Vati-Siddhi* consistency, allowing for the formation of 500 mg tablets. The final product was subjected to organoleptic and analytical testing, revealing a black color, bitter taste, and a characteristic odor of goat urine.

Table 1: Pharmacological profile of *Maha Agad* components.

Ingredient	Botanical/English Name	Ayurvedic Property	Rationale in PCOS
<i>Trivrit</i>	<i>Operculina turpethum</i>	<i>Sukha Virechaka</i>	Eliminates <i>Ama</i> and <i>Dushi Visha</i> through the gut.
<i>Vishalya</i>	<i>Gloriosa superba</i>	<i>Tikshna-Ushna</i>	Stimulates <i>Artavavaha Srotas</i> ; breaks ovarian cysts.
<i>Madhuka</i>	<i>Glycyrrhiza glabra</i>	<i>Vrishya, Pittahara</i>	Anti-androgenic; balances <i>Tikshna</i> drugs.
<i>Haridra</i>	<i>Curcuma longa</i>	<i>Vishaghna, Lekhana</i>	Anti-inflammatory; improves insulin sensitivity.
<i>Daruharidra</i>	<i>Berberis aristata</i>	<i>Kaphahara, Medohara</i>	Berberine content reduces visceral fat and IR.
<i>Manjistha</i>	<i>Rubia cordifolia</i>	<i>Raktashodhaka</i>	Purifies blood; regulates sex steroids.
<i>Shunthi</i>	<i>Zingiber officinale</i>	<i>Deepana-Pachana</i>	Enhances thermogenesis and fat metabolism.
<i>Pippali</i>	<i>Piper longum</i>	<i>Yogavahi, Rasayana</i>	Bio-enhancer; stimulates follicle maturation.
<i>Maricha</i>	<i>Piper nigrum</i>	<i>Pramathi</i>	Clears channel obstruction (<i>Srotorodha</i>).
<i>Pancha Lavan</i>	Five Salts	<i>Srotoshodhana</i>	Facilitates drug penetration and <i>Vata-anulomana</i> .
<i>Basta Mutra</i>	Goat Urine	<i>Kshariya, Tikshna</i>	Acts as a potent vehicle for systemic detoxification.

3.4. Posology and Follow-up

The intervention followed a strict schedule:

- **Dose:** 2 Tablets (approx. 1g total).
- **Frequency:** Three times daily after meals.
- **Duration:** 60 Days.
- **Follow-up:** Every 15 days, with a final assessment on the 60th day.

4. Therapeutic Agents: Comprehensive Pharmacological Rationale

The efficacy of *Maha Agad* is derived from the convergence of traditional Ayurvedic energetics and modern phytochemical evidence.

4.1. Modulation of the HPO Axis and Anti-Androgenic Effects

A critical challenge in PCOS is hyperandrogenism, which leads to hirsutism and anovulation. *Glycyrrhiza glabra* (Madhuka) contains glycyrrhetic acid, which has been shown to block 11 β -hydroxysteroid dehydrogenase and bind to mineralocorticoid receptors. More importantly, experimental studies in women with PCOS demonstrate that 3.5g/day of licorice extract significantly reduces serum testosterone levels. In *Maha Agad*, *Madhuka* acts synergistically with *Rubia cordifolia*, which has been shown in letrozole-induced PCOS models to improve serum levels of FSH, estrogen, and progesterone while reducing LH surges and testosterone. This combination effectively resets the HPO axis, facilitating the transition from follicular arrest to ovulation.^{vii}

4.2. Resolution of Insulin Resistance and Metabolic Syndrome

Obesity and insulin resistance are the primary metabolic drivers of PCOS. *Berberis aristata* (Daruharidra) is a potent source of berberine, an alkaloid that has shown clinical efficacy comparable to metformin in reducing insulin resistance and redistributing adipose tissue. Berberine enhances the expression of Glut-4 in ovarian tissues,

improving glucose uptake and reducing the hyperinsulinemic stimulation of thecal cells.^{viii}

Furthermore, *Curcuma longa* (Haridra) provides curcumin, which inhibits the NF- κ B pathway. This inhibition reduces the release of pro-inflammatory cytokines like TNF- α and IL-6, which are elevated in the chronic low-grade inflammation seen in PCOS. By mitigating systemic inflammation, *Haridra* improves the overall metabolic environment, supporting weight loss and reducing the risk of type 2 diabetes.^{ix}

4.3. Channel Cleansing and Follicular Stimulation

From an *Agada Tantra* perspective, the "obstruction" in the ovaries is a manifestation of *Srotorodha* caused by *Ama* and *Dushi Visha*. *Trivrit* (*Operculina turpethum*) acts as a systemic cleanser, using its purgative properties to remove lipophilic toxins from the gastrointestinal tract and blood. *Gloriosa superba* (Langali) provides a "scraping" (*Lekhana*) effect on the ovarian stroma, while the *Trikatu* combination (Ginger, Long Pepper, Black Pepper) enhances the bioavailability of these phytochemicals through the action of piperine. The use of *Basta Mutra* (goat urine) as a triturating agent is particularly significant; its alkaline and *Tikshna* properties allow the formulation to penetrate the *Meda Dhatu* (fat tissue) where modern toxins (*Dushi Visha*) are sequestered, ensuring a deep-tissue detoxification.^x

5. Results and Observations

The 60-day clinical trial yielded data from 30 subjects, providing significant insights into the therapeutic potential of *Maha Agad*.

5.1. Demographic and Baseline Characteristics

The demographic analysis highlighted the lifestyle-related nature of the disorder, with a vast majority of patients hailing from urban environments (96.67%).

Table 2: Baseline Demographic and Constitutional Profile.

Parameter	Observation	Percentage/Value
Age Distribution	18–25 Years	56.67%
Agni Status	Manda (Sluggish Digestion)	80.00%
Prakriti	Kapha-Pitta	53.33%
Dietary Habits	Vegetarian	60.00%
Sara	Madhyama (Medium)	96.67%
Marital Status	Unmarried	73.33%

The high prevalence of *Manda Agni* (80%) corroborates the Ayurvedic theory that metabolic insufficiency is the root cause of *Ama* formation,

which subsequently facilitates the retention of *Dushi Visha*.

5.2. Efficacy on Subjective Clinical Parameters

The administration of *Maha Agad* resulted in a statistically significant improvement in all clinical

symptoms of *Artava Kshaya*.

Table 3: Impact on Subjective Symptoms after 60 Days.

Clinical Symptom	Percentage Relief	Statistical Significance (P)
Pelvic Pain	83.35%	< 0.0001
Menstrual Regularity	80.74%	< 0.0001
Menstrual Flow (Pads)	77.76%	< 0.0001
Duration of Period	72.67%	< 0.0001
Total Subjective Score	78.35%	< 0.0001

The profound reduction in pelvic pain (83.35%) suggests a highly effective *Vata-Shamana* and *Anulomana* effect, likely due to the clearing of channel obstructions. The normalization of flow and regularity indicates a restoration of the *Upadhatu* formation process, which relies on a healthy *Rasa Dhatu*.

5.3. Efficacy on Objective Parameters (Morphology and Metabolism)

Objective measurements via ultrasonography and BMI assessment provided concrete evidence of the formulation's impact on ovarian anatomy and systemic metabolism.

5.3.1. Ultrasonographic Changes (Ovarian Volume)

A reduction in ovarian volume is indicative of resolving follicular arrest and stromal hypertrophy.

Table 4: Changes in Ovarian Volume (P < 0.0001).

Ovarian Metric	Before Treatment (cc)	After Treatment (cc)	% Reduction
Right Ovarian Volume	12.45 ± 2.1	8.19 ± 1.5	34.20%
Left Ovarian Volume	11.92 ± 1.8	7.94 ± 1.4	33.42%

5.3.2. Body Mass Index (BMI) and Weight Management

Given the *Manda Agni* and *Meda-Srotorodha* observed at baseline, the *Lekhana* (scraping) action of the drug was essential for weight reduction. Patients showed a significant mean reduction in BMI, shifting many from the "Pre-obese" to the "Normal" range, which is a known catalyst for spontaneous ovulation in PCOS.^{xi}

6. Discussion

The clinical results of this study validate the effectiveness of an *Agada*-based therapeutic approach in managing the modern epidemic of PCOS. The discussion focuses on the dialectical synthesis of Ayurvedic principles and modern endocrinology.

6.1. The "Latent Toxic" Pathogenesis (*Samprapti Vighatana*)

The pathogenesis of PCOS in this study is conceptualized through the lens of *Dushi Visha Janya Artava Kshaya*. The initial insult (*Nidana*) is the chronic consumption of *Ahita Ahara* (junk food, EDCs), which suppresses the *Jatharagni* and leads to *Agnimandya*. This creates *Ama*, which, when combined with exogenous environmental toxins, transforms into *Dushi Visha*. Due to its heavy and stagnant nature, this toxin settles in the *Meda*

(adipose) and *Artavavaha Srotas*, causing *Srotorodha*.^{xii}

The resulting "stagnant" ovary fails to release the *Beeja* (ovum), leading to the accumulation of atretic follicles and a reduction in the cyclical discharge of *Artava*. *Maha Agad* intervenes by:

1. ***Agni-Deepana***: Igniting the metabolic fire to stop further *Ama* production.
2. ***Visha-Prashamana***: Neutralizing the latent toxins using herbs like *Haridra* and *Manjistha*.
3. ***Srotoshodhana***: Clearing the cystic obstructions in the ovaries through the *Tikshna* action of *Langali* and the alkaline property of *Basta Mutra*.
4. ***Artava-Janana***: Restoring the *Agneya* (fiery) property of *Artava*, thereby initiating regular menstruation.

6.2. Integration of Modern Bio-Mechanisms

The observed 34% reduction in ovarian volume correlates directly with modern findings on berberine and curcumin. Berberine's ability to improve insulin sensitivity via the Glut-4 receptor mimics the action of metformin, reducing the hyperinsulinemic drive that causes stromal hypertrophy. Simultaneously, the reduction in BMI decreases the peripheral aromatization of androgens to estrone, which reduces the tonic positive feedback to LH, thereby restoring the normal LH/FSH ratio.

The inclusion of *Glycyrrhiza glabra* (Madhuka) is a masterstroke in the formulation; its anti-androgenic effect specifically targets the *Pitta-Rakta* component of hyperandrogenism (acne and hirsutism), while its *Madhura Rasa* and *Sheeta Virya* act as a buffer against the potentially irritating effects of *Tikshna* drugs on the gastric mucosa.^{xiii}

6.3. The Relevance of *Agada Tantra* in Modern Medicine

This investigation highlights that *Agada Tantra* is not merely a specialty for snake bites or acute poisoning but a vital framework for treating modern "slow poisons" (*Dushi Visha*). The EDCs we encounter in our daily urban lives BPA in plastics, pesticides in vegetables, and chemicals in cosmetics are the *Dushi Visha* of the 21st century. Traditional *Agada* formulations like *Maha Agad* offer a systemic detoxification that goes beyond the hormonal palliation of conventional medicine, addressing the chronic toxic load that underlies endocrine disruption.

7. Conclusion

The clinical study demonstrates that *Maha Agad* is a highly effective intervention for the management of *Dushi Visha Janya Artava Kshaya* (PCOS). The treatment successfully achieved its primary objective of reducing ovarian volume (approx. 34% reduction) and its secondary objectives of normalizing menstrual regularity and flow (approx. 80% improvement). The statistical significance ($P < 0.0001$) across both subjective and objective parameters warrants the rejection of the null hypothesis.

The findings suggest that Ayurvedic detoxification protocols from *Agada Tantra* can safely and effectively resolve the metabolic and anatomical pathologies of PCOS. While the 60-day results are promising, extending the treatment duration to 6 months in future studies is recommended to evaluate the impact on long-term fertility and the sustainability of weight loss. *Maha Agad* stands as a potent, holistic alternative to conventional therapies, offering a path to reproductive health through metabolic and toxicological correction.

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