

## Evaluation of the Efficacy of Manjishtadi Kashaya in the Management of Post-Acne Hyperpigmentation

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### ABSTRACT

Acne is a prevalent dermatological disorder, often complicated by post-inflammatory hyperpigmentation (PIH), particularly in individuals with darker skin phototypes. PIH results from inflammation-driven melanogenesis and trauma-related varna vaishamya (discoloration). From an Ayurvedic perspective, this condition resembles Vyanga and Shyavata, arising from vitiated Pitta and Rakta dosha along with Vata involvement, leading to Raktadushti and disturbed skin complexion.

Manjishtadi Kashaya, a classical Rakta-shodhaka formulation, contains Manjishta (*Rubia cordifolia*), Sariva (*Hemidesmus indicus*), Guduchi (*Tinospora cordifolia*), Triphala, and other Pitta-Rakta pacifying drugs. These herbs exhibit Varnya (complexion-enhancing), Shothahara (anti-inflammatory), Raktaprasadana (blood-purifying), and Tvachya (skin-beneficial) properties, aligning with the pathological basis of PIH.

This study evaluates the efficacy of Manjishtadi Kashaya in reducing PIH by addressing both systemic (dosha-dushti) and local pathological processes. Clinical parameters, pigmentation changes, and risk factors (skin type, gender, severity of acne, sunlight exposure, lesion trauma) were assessed. Preliminary findings suggest that Manjishtadi Kashaya may provide a safe, holistic therapeutic approach in PIH by balancing Pitta-Rakta dushti, mitigating inflammation, and restoring normal varna.

**KEYWORDS:** Post-acne hyperpigmentation, Manjishtadi Kashaya, Ayurveda, Vyanga, Pitta-Rakta dushti.

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### INTRODUCTION

The Acne vulgaris affects nearly 85% of adolescents and young adults, with complications such as scarring and post-inflammatory hyperpigmentation (PIH) causing significant psychosocial distress. PIH is more common in individuals with darker skin types (Fitzpatrick III–V), where cosmetic disfigurement often surpasses the impact of acne itself. Inflammation-induced melanogenesis, keratinocyte-derived cytokines, UV exposure, and physical trauma (squeezing, scratching) contribute to the pathogenesis of PIH.

Post-inflammatory hyperpigmentation (PIH) is a common dermatological complaint following acne vulgaris, especially in darker skin types (Fitzpatrick IV–VI). Conventional management includes hydroquinone, retinoids, and chemical peels, which may be associated with irritation and recurrence.

In Ayurveda, Mukhadushika (acne) and its sequelae are considered under Kshudra Roga. Pathogenesis involves Rakta, Pitta, and Kapha vitiation leading to Varnya (skin complexion disturbance) and residual pigmentation.

Manjishtadi Kashaya, described in Sahasrayoga and other formulations, contains *Rubia cordifolia* (Manjishta), *Hemidesmus indicus* (Sariva), *Tinospora cordifolia* (Guduchi), *Azadirachta indica* (Nimba), *Terminalia chebula* (Haritaki), among others. Pharmacologically, these drugs possess anti-inflammatory, antioxidant, melanogenesis-modulating, and blood-purifying (Raktashodhaka) properties, making them suitable for PIH management.

Manjishtadi Kashaya is a well-documented classical decoction prescribed in Rakta-pradoshaja vikara. The key herb Manjishta (*Rubia cordifolia*) has potent antioxidant, anti-inflammatory, and anti-tyrosinase activity, while Sariva and Guduchi purify blood and balance Pitta. Thus, this formulation provides a scientific and Ayurvedic rationale for use in PIH.

## PATHOGENESIS OF POST-ACNE HYPERPIGMENTATION: AN AYURVEDIC CORRELATION

In modern dermatology, the pathogenesis of post-acne hyperpigmentation (PIH) is primarily attributed to inflammatory processes within the pilosebaceous unit. Pro-inflammatory mediators stimulate melanocyte activity, resulting in excessive melanin synthesis and deposition, which clinically manifests as residual pigmentation following acne lesions. Additionally, mechanical trauma (scratching, squeezing) and ultraviolet exposure act as aggravating factors by enhancing melanogenic signaling pathways.

In Ayurveda, such pigmentary disorders can be correlated with Vyanga and Shyavata, conditions described under Kshudra Roga. The governing role of Pitta dosha in regulating varna (skin color) is well established, and its vitiation leads to hyperpigmentation. Simultaneously, Rakta dhatu dushti manifests externally as discoloration of the skin, corresponding to the dermal involvement observed in PIH. The association of Vata dosha explains chronicity, recurrence, and the textural irregularities often seen in acne sequelae. Furthermore, external trauma such as habitual squeezing or scratching of lesions can be interpreted as nidana sevana (aggravating factors), which further disturb Rakta and Pitta, thereby worsening pigmentation.

Thus, both modern and classical perspectives converge on a common understanding: inflammation, vascular involvement, and trauma are central to the genesis of PIH. This integrative approach provides a rational basis for employing Raktashodhaka and Pitta-shamaka formulations such as Manjishtadi Kashaya in its management.

**Table 1. Composition of Manjishtadi Kashaya**

Sr. No.	Drug (Botanical name)	Part used	Key Ayurvedic Properties	Pharmacological actions
1	<i>Rubia cordifolia</i> (Manjishta)	Root	Raktashodhaka, Shothahara	Varnya, Anti-inflammatory, antioxidant, depigmenting
2	<i>Hemidesmus indicus</i> (Sariva)	Root	Pitta–Rakta shamaka	Immunomodulator, detoxifier
3	<i>Tinospora cordifolia</i> (Guduchi)	Stem	Tridoshaghna, Rasayana	Anti-inflammatory, immunomodulatory
4	<i>Azadirachta indica</i> (Nimba)	Leaf	Krimighna, Raktashodhaka	Antimicrobial, detoxifier
5	<i>Terminalia chebula</i> (Haritaki)	Fruit	Vata–Kapha shamaka, Rasayana	Laxative, antioxidant
6	<i>Terminalia bellirica</i> (Bibhitaka)	Fruit	Tridoshaghna	Antioxidant, digestive
7	<i>Emblica officinalis</i> (Amalaki)	Fruit	Tridoshaghna, Rasayana	Antioxidant, collagen stimulator

## MATERIALS AND METHODS

Study Design: Open-label clinical study

Study Population: 30 patients with post-acne pigmentation (PIH), aged 18–35 years, attending Dermatology OPD.

### Inclusion Criteria:

Patients with acne-free but residual pigmentation (1–6 months duration).

Age 18–35 years.

Fitzpatrick skin types III–V.

Presence of post-acne hyperpigmentation for >4 weeks.

### Exclusion Criteria:

Active acne, use of systemic retinoids or steroids, pregnancy, other pigmentation disorders.

Use of systemic retinoids, corticosteroids, or depigmenting agents in the past 3 months.

Coexisting pigmentary disorders (melasma, lichen planus pigmentosus, etc.).

Pregnancy or lactation.

### Comprehensive Ayurvedic Treatment Protocol for Post-acne Pigmentation (PIH)

Sr. No.	Intervention	Form	Dosage Method	/ Anupan Vehicle	/ Frequency	Duration	Ayurvedic Rationale
1	<i>Manjishtadi Kashaya</i>	Decoction	40 ml	Lukewarm water	Twice daily (before meals)	8 weeks	Raktashodhaka, Varnya, Shothahara
2	<i>Kumkumadi Taila</i> (Bahya Prayoga)	External application	Few drops applied to PIH – lesions		Once daily at night	8 weeks	Varnya, Tvachya, promotes pigmentation balance
3	<i>Lepa</i> (herbal face pack)	Paste of Manjishta Sariva	Apply on affected areas, + wash after 20	Rose water / milk	Twice weekly	8 weeks	Shothahara, improves skin tone

Sr. No.	Intervention	Form	Dosage Method	/ Anupan Vehicle	/ Frequency	Duration	Ayurvedic Rationale
		Chandan	min				
4	<i>Pathya</i> regimen)	(Diet –	Avoid spicy, fermented foods	oily, Include fresh fruits, green vegetables, barley, old rice	Daily	Throughout study	Prevents Kapha–Pitta aggravation, supports Raktaprasadana
5	<i>Apathya</i> avoid)	(to –	Excess milk products, fried food, stress, day-sleep	–	Daily	Throughout study	Prevents acne aggravation and PIH darkening

**Table: Comparative Perspective of PIH in Modern Dermatology and Ayurveda**

Aspect	Modern Dermatology	Ayurveda
<b>Pathogenesis</b>	Inflammation → cytokine release (IL-1, TNF-α, ET-1) → melanocyte stimulation → excess melanin deposition	<i>Pitta</i> aggravation with <i>Rakta dushti</i> and <i>Vata</i> involvement → <i>varna vaishamy</i> (discoloration), <i>shyava varna</i> patches
<b>Causative Factors</b>	- Acne severity and inflammation - Lesion trauma (scratching, squeezing) - Ultraviolet exposure - Darker skin phototypes	- Aggravating factors: <i>ushna</i> (heat), <i>katu–amla–lavana rasa</i> (spicy, sour, salty foods) - <i>Atapa sevana</i> (excess sun exposure) - <i>Krodha, chinta</i> (stress) - Vitiated <i>ahara-vihara</i>
<b>Clinical Features</b>	- Hyperpigmented macules/patches at acne sites - More common in Fitzpatrick skin types III–V	- <i>Vyanga</i> : niruja (painless), <i>shyava varna</i> (bluish-brown discoloration) - <i>Shyavata</i> : dusky pigmentation of face/skin
<b>Treatment Principles</b>	- Topical depigmenting agents (hydroquinone, retinoids, azelaic acid) - Chemical peels, lasers - Sun protection	- <i>Pitta-Rakta shamana</i> (pacification of pitta and rakta) - <i>Raktashodhana</i> (blood purification) - <i>Varnya dravyas</i> (complexion-enhancing herbs) - <i>Shothahara</i> (anti-inflammatory measures)
<b>Role of Manjishtadi Kashaya</b>	Provides anti-inflammatory, antioxidant, and melanogenesis-modulating effects aligning with dermatological goals	Acts as <i>Raktashodhaka, Pitta-shamaka, Varnya</i> , and <i>Tvachya</i> —correcting dosha imbalance and restoring normal complexion

**Assessment Parameters**

- **Modified Melasma Area Severity Index (mMASI)** adapted for PIH
- **Patient-reported outcomes:** Improvement in pigmentation, satisfaction score
- **Adverse events monitoring**

**Statistical Analysis:**

Paired *t*-test applied to pre- and post-treatment pigmentation and erythema scores.

**RESULTS**

Out of 32 enrolled patients, 30 completed the 8-week trial (completion rate 93.75%).

The mean pigmentation score decreased significantly (*p* < 0.05) after 8 weeks. 70% of patients reported moderate-to-good improvement in pigmentation. Erythema and residual inflammation were notably reduced, aiding faster resolution of PIH. No adverse effects such as gastric irritation, dermatitis, or rebound hyperpigmentation were reported.

**Table 3. Baseline Characteristics of Patients (n = 32)**

Variable	Value
Mean Age (years)	21.8 ± 2.9
Gender (Male/Female)	13 / 19
Fitzpatrick Skin Type	III = 8, IV = 15, V = 9
Duration of PIH	< 3 months = 21, 3–6 months = 11
Previous treatments	40% topical steroids, 30% retinoids, 30% none

**Effect on Pigmentation Scores (mMASI Adapted for PIH) (n = 30 completers)**

Parameter	Baseline (Mean ± SD)	Week 4	Week 8	% Improvement	<i>p</i> -value
Pigmentation score	8.6 ± 1.2	6.2 ± 1.1	4.1 ± 1.0	52%	< 0.05

Parameter	Baseline (Mean $\pm$ SD)	Week 4	Week 8	% Improvement	p-value
Erythema score	2.4 $\pm$ 0.5	1.6 $\pm$ 0.4	1.0 $\pm$ 0.3	58%	< 0.05
Patient satisfaction (VAS 0–10)	3.2 $\pm$ 1.1	6.4 $\pm$ 1.0	8.1 $\pm$ 0.9	–	< 0.05

#### Patient-Reported Outcomes (n = 30 completers)

Outcome parameter	Improved (%)	Not Improved (%)
Pigmentation lightening	85	15
Reduction in erythema	75	25
Evenness of skin tone	70	30
Reduction in new acne lesions	65	35
No adverse effects	100	0

## DISCUSSION

Post-acne hyperpigmentation (PIH) is a common sequela of acne, particularly in darker phototypes. Modern dermatology attributes it to inflammatory mediators stimulating melanocytes, with trauma (scratching, squeezing) and ultraviolet exposure acting as aggravating factors [8,9].

In Ayurveda, PIH correlates with Vyanga and Shyavata, both arising from Pitta–Rakta dushti and Vata anubandha. Pitta governs pigmentation (varna), while vitiated Rakta manifests as skin discoloration. External trauma and sunlight are described as nidanas that worsen Rakta dushti [1–4].

Manjishtadi Kashaya offers a logical intervention as a Raktashodhaka and Pitta-shamaka formulation. Manjishtha is Varnya and Raktaprasadaka [5], while Sariva, Guduchi, and Triphala contribute antioxidant, anti-inflammatory, and complexion-enhancing effects [6]. Its Tikta–Kashaya rasa, Sheeta virya, and Madhura vipaka properties make it effective in reducing pigmentation by addressing the root pathology of Rakta–Pitta dushti.

Thus, while modern science emphasizes inflammation and melanogenesis, Ayurveda highlights dosha–dhatu imbalance. The integrative application of Manjishtadi Kashaya bridges both perspectives, offering a safe and holistic option for PIH management.

## CONCLUSION

Post-acne hyperpigmentation (PIH) is a frequent and distressing sequela of acne, particularly in individuals with darker skin phototypes. The present study highlights the multifactorial nature of PIH, where inflammation, trauma, and ultraviolet exposure play central roles in its pathogenesis. From an Ayurvedic perspective, PIH can be correlated with Vyanga and Shyavata, arising from Pitta–Rakta dushti with Vata anubandha, resulting in varna vaishmya (skin discoloration).

Manjishtadi Kashaya, with its Raktashodhaka, Pitta-shamaka, Varnya, and Tvachya properties, directly addresses these derangements. The integrative interpretation suggests that the formulation reduces inflammation, purifies Rakta, pacifies Pitta, and restores normal complexion, making it a rational and holistic option for managing PIH. Future clinical studies combining objective dermatological assessment with Ayurvedic principles are warranted to establish its efficacy and bridge traditional wisdom with modern evidence-based practice.

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