ARTICLE

AN EXPLORATORY SINGLE ARM STUDY ON THE EFFICACY OF DHATURADI TAILA ALONG WITH BRIHATYADI LEPA AND YASHTIMADHU TAILA NASYA IN THE MANAGEMENT OF INDRALUPTA (ALOPECIA AREATA)

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ABSTRACT

Background: Alopecia areata is a chronic, immune-mediated, non-scarring hair loss disorder with significant psychosocial impact. Despite various treatment modalities, recurrence and incomplete regrowth remain challenging. Ayurveda describes this condition as Indralupta, a Tridoshaja disorder with involvement of Dushivisha (latent toxicity). This study evaluated the efficacy of Dhaturadi Taila (topical application), Brihatyadi Lepa (local paste), and Yashtimadhu Taila Nasya (nasal administration) in managing Indralupta (Alopecia areata). Methods: A prospective, interventional, single-arm clinical trial was conducted on 30 patients aged 16-35 years with clinically diagnosed Indralupta (Alopecia areata). Participants received Dhaturadi Taila for Shiro Abhyanga twice daily, Brihatyadi Lepa applied locally twice daily, and Yashtimadhu Taila Nasya (2 drops in each nostril) twice daily for 60 days. Assessment included Severity of Alopecia Tool (SALT) Score, Hair Pull Test, Itching (Kandu) scoring, and laboratory investigations (CBC, ESR) at baseline and post-treatment. Data were analyzed using Wilcoxon signed-rank test and paired t-test. Results: The mean SALT Score decreased significantly from 19.83±2.09 to 9.60±1.71 (51.4% improvement, $p<0.001$). Hair Pull Test improved by 55.83% ($p<0.001$), and Itching (Kandu) improved by 49.43% ($p<0.001$). Total Leukocyte Count and Neutrophil count showed statistically significant improvement ($p<0.001$). Hemoglobin, lymphocyte, monocyte, eosinophil, basophil, platelet count, and ESR showed non-significant changes. No adverse drug reactions were reported. Conclusion: The combined therapy of Dhaturadi Taila, Brihatyadi Lepa, and Yashtimadhu Taila Nasya demonstrated significant efficacy and safety in managing Indralupta (Alopecia areata), providing a holistic approach addressing both local scalp pathology and systemic factors.

Keywords: Alopecia areata, Indralupta, Dhaturadi Taila, Brihatyadi Lepa, Yashtimadhu Taila Nasya, Dushivisha, Ayurveda Clinical Trial Registration: CTRI/2025/03/083048

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1. INTRODUCTION

Hair is an important appendage of the body that significantly contributes to physical appearance, personality, and self-confidence. In Ayurveda, healthy, smooth, black, and firmly rooted hair is considered a sign of good health and proper nourishment of body tissues [1]. Hair is regarded as *Mala* of *Asthi Dhatu* according to Ayurvedic principles [2].

Hair loss has become a common health problem worldwide, affecting individuals irrespective of age and gender. Among various hair disorders, Alopecia areata is one of the most frequently encountered autoimmune conditions, characterized by sudden, localized, non-scarring loss of hair from the scalp and other hair-bearing areas [3]. The disease usually presents as well-defined circular or oval bald patches and may progress to Alopecia totalis or Alopecia universalis in severe cases [4].

The exact etiology of Alopecia areata remains unclear; however, genetic predisposition, autoimmune mechanisms, environmental factors, emotional stress, infections, and toxic exposures are considered important contributors [5]. According to the Indian Journal of Dermatology, Venereology and Leprology, the prevalence of Alopecia areata in India is approximately 0.7% [6].

Hair loss significantly affects the psychosocial well-being of patients and often leads to anxiety, depression, low self-esteem, and impaired quality of life [7]. Although various treatment modalities such as corticosteroids, minoxidil, immunotherapy, and phototherapy are available in contemporary medicine, the results are often unsatisfactory due to recurrence, incomplete hair regrowth, and adverse effects associated with long-term therapy [8]. Therefore, there is a need for safe, economical, and effective therapeutic alternatives.

Ayurveda describes various diseases affecting hair under the broad spectrum of *Kshudra Roga* and *Kapalagata Roga*. Alopecia areata can be correlated with *Indralupta* described by Acharya Sushruta in *Nidana Sthana*. According to Sushruta, aggravated *Pitta* associated with *Vata* enters the *Romakoopa* (hair follicles) and causes hair fall. Subsequently, *Kapha* associated with *Rakta* obstructs the hair follicles and prevents regrowth of hair [9]:

Sushruta indicates the predominant involvement of *Vata*, *Pitta*, *Kapha*, and *Rakta* in the pathogenesis of *Indralupta*. *Vata* and *Pitta* are responsible for hair fall, while *Kapha* and *Rakta* obstruct the hair follicles, leading to inhibition of hair regeneration [9].

Acharya Vagbhata and Acharya Vriddha Vagbhata have also described *Indralupta* among diseases affecting the scalp and hair [10,11]. The disease is considered to involve *Tridosha* with predominance of *Vata* and *Pitta* along with *Rakta Dushti*.

Agada Tantra describes a unique concept known as *Dushivisha*. *Dushivisha* refers to residual poison that remains in the body for a prolonged period after partial elimination or detoxification and produces chronic manifestations [12]. Continuous exposure to incompatible foods (*Viruddha Ahara*), polluted environment, pesticides, preservatives, chemical additives, and unhealthy lifestyle practices may result in the accumulation of toxic substances in the body resembling *Dushivisha* [13].

Acharya Sushruta has mentioned hair fall and loss of body hair as important manifestations of *Dushivisha* [14]:

Sushruta indicates that chronic toxic accumulation can affect hair follicles and lead to extensive hair loss. Furthermore, Acharya Charaka, while describing diseases caused by excessive intake of *Lavana*, *Kshara*, and *Viruddha Ahara*, has mentioned symptoms resembling *Indralupta* [15]. Therefore, *Dushivisha* may be considered an important etiological factor in the development of *Indralupta*.

Considering the increasing incidence of autoimmune diseases and environmental toxic exposure, there is a growing need to explore Ayurvedic interventions capable of addressing both local pathology and systemic causative factors. Ayurveda offers several treatment modalities including *Taila*, *Lepa*, *Nasya*, and *Shodhana* therapies for the management of *Indralupta* [16].

Dhaturadi Taila described in *Sahasrayoga* is indicated in *Keshachyuti* and *Kandu*. The ingredients of *Dhaturadi Taila* possess *Keshya*, *Kushtaghna*, *Kandughna*, and *Romotpadaka* properties that may stimulate dormant hair follicles and promote hair growth [17].

Brihatyadi Lepa mentioned in *Chakradatta* is specifically indicated in *Indralupta* and is traditionally used for local application over affected areas [18].

Yashtimadhu Taila described in *Sharangadhara Samhita* possesses *Rasayana*, *Vata-Pittahara*, and *Keshya* properties. Administration of *Nasya* is considered especially beneficial in disorders situated above the clavicle because "Nasa Hi Shiraso Dwaram" (the nose is the gateway to the head) [19].

Therefore, the combined use of *Dhaturadi Taila*, *Brihatyadi Lepa*, and *Yashtimadhu Taila Nasya* may offer a comprehensive therapeutic approach by correcting *Dosha* imbalance, removing follicular obstruction, nourishing scalp tissues, promoting hair regrowth, and combating the underlying *Dushivisha*-related pathology. However, scientific evidence regarding this combination therapy in the management of *Indralupta* is limited.

Hence, the present study entitled "An Exploratory Single Arm Study on the Efficacy of *Dhaturadi Taila* Along with *Brihatyadi Lepa* and *Yashtimadhu Taila Nasya* in the Management of *Indralupta* (Alopecia areata)" has been undertaken to evaluate its clinical efficacy and establish scientific evidence for its therapeutic utility.

Aim: To determine the effect of *Dhaturadi Taila* along with *Brihatyadi Lepa* and *Yashtimadhu Taila Nasya* in the management of *Indralupta* (Alopecia areata).

Objectives

- To evaluate therapeutic efficacy over a period of 60 days
- To study the etiopathogenesis of *Indralupta* as per classical and modern texts
- To assess changes in clinical features of *Indralupta*

Null Hypothesis (H_0): Administration of *Dhaturadi Taila*, *Brihatyadi Lepa*, and *Yashtimadhu Taila Nasya* is not effective in the management of *Indralupta* (Alopecia areata).

Alternative Hypothesis (H_1): Administration of *Dhaturadi Taila*, *Brihatyadi Lepa*, and *Yashtimadhu Taila Nasya* may be effective in the management of *Indralupta* (Alopecia areata).

2. MATERIALS AND METHODS

2.1 Study Design

A prospective, interventional, single-arm, exploratory clinical trial was conducted at the Post Graduate Institute of Ayurveda, Dr. Sarvepalli Radhakrishnan Rajasthan Ayurved University, Jodhpur. The study was approved by the Institutional Ethics Committee (IEC No.: DSRRAU/PGIAS/IEC/23-24/791) and registered prospectively in the Clinical Trials Registry-India (CTRI/2025/03/083048). Written informed consent was obtained from all participants.

2.2 Study Participants

Inclusion Criteria

- Age above 16 years and below 35 years
- Patients of either sex
- Patients willing to give consent for clinical trial
- Patients suffering from Alopecia areata

Exclusion Criteria

- Age below 16 years and above 35 years
- Patients with any systemic illness
- Patients suffering from alopecia universalis or alopecia totalis
- Hair fall in post-delivery lactation period
- Cancer patients on chemotherapy treatment

2.3 Sample Size

Thirty (30) patients were enrolled following a sample size calculation with 80% power and 5% significance level.

2.4 Study Interventions

1. DHATURADI TAILA (FOR SHIRO ABHYANGA)

Ingredients

- *Dhatura Patra Swarasa* (Fresh juice of *Datura metel* leaves) - 640 ml
- *Tila Taila* (Sesame oil) - 160 ml
- *Dhatura Beeja* (Seeds of *Datura metel*) - 40 gm

Method of Preparation: *Dhaturadi Taila* was prepared by processing *Tila Taila* with fresh *Dhatura* leaf juice (*Swarasa*) and finely powdered *Dhatura* seeds according to the classical *Sneha Kalpana* method. The mixture was heated over mild fire until *Sneha Siddhi Lakshanas* were attained, then cooled, filtered, and stored in an airtight bottle [17].

Dosage: As per requirement, applied on the scalp twice daily for 60 days.

2. BRIHATYADI LEPA (FOR LOCAL APPLICATION)

Ingredients

- *Brihati Phala Swarasa* (Fruit juice of *Solanum indicum*) - 1 part
- *Dhatura Patra* (Leaves of *Datura metel*) - 1 part
- *Gunja Phala* (Fruit powder of *Abrus precatorius*) - 1 part

Method of Preparation: Fresh *Brihati* fruits were washed thoroughly and crushed to obtain *Swarasa* (fresh fruit juice). *Gunja* fruit powder was gradually mixed with the *Swarasa* and triturated until a smooth, homogeneous *Lepa* was formed. The *Lepa* was prepared fresh immediately before each application. Prior to *Lepa* application, fresh *Dhatura* leaves were washed thoroughly and gently rubbed over the affected scalp area as described in the classical text [18].

Dosage: 1/3 *Angushta* (approximately 1-2 mm thickness) applied locally twice daily for 60 days.

3. YASHTIMADHU TAILA NASYA (FOR NASAL ADMINISTRATION)

Ingredients

- *Yashtimadhu* (*Glycyrrhiza glabra*) - ½ part
- *Tila Taila* (Sesame oil) - 4 parts
- *Dhatri Phala* (*Phyllanthus emblica*) - 16 parts
- *Yavakshara* - ½ part

Method of Preparation: *Tila Taila* was processed with *Yashtimadhu Kalka*, *Amalaki Swarasa*, and *Yavakshara* following the classical *Sneha Kalpana* method. The mixture was heated over mild fire until *Sneha Siddhi Lakshanas* were achieved, then cooled, filtered, and stored in an airtight amber-colored glass bottle for *Nasya* use [19].

Dosage: 2 drops in each nostril twice daily (before food) for 60 days.

2.5 Assessment Criteria

Subjective Parameters

1. SEVERITY OF ALOPECIA TOOL (SALT) SCORE

The SALT Score quantifies the percentage of scalp hair loss. The scalp is divided into four quadrants: Top (40%), Back (24%), Left Side (18%), and Right Side (18%). The percentage of hair loss in each quadrant is assessed and multiplied by the area score to calculate the total SALT

Alopecia Areata Severity Scale

- Mild: Up to 20% scalp hair loss
- Moderate: 21% to 49% scalp hair loss
- Severe: 50% to 100% scalp hair loss

2. HAIR PULL TEST

- Grade 0: 0-5 hairs
- Grade 1: 6-10 hairs
- Grade 2: 11-15 hairs
- Grade 3: 16-20 hairs
- Grade 4: Above 20 hairs

3. ITCHING (KANDU)

- Grade 0: No itching
- Grade 1: Occasional itching (mild)
- Grade 2: Intermittent itching (moderate)
- Grade 3: Continuous itching (severe)

Objective Parameters

- Complete Blood Count (CBC)
- Erythrocyte Sedimentation Rate (ESR)

2.6 Data Collection

All patients underwent detailed clinical examination including *Dashavidha Pariksha*, *Ashtavidha Pariksha*, general examination, and personal history assessment. Findings were systematically recorded in a specially designed Case Record Form (CRF). Participants were evaluated at baseline and after 60 days of treatment.

2.7 Statistical Analysis

Data were expressed as Mean ± Standard Deviation (SD). Pre- and post-treatment comparisons were analyzed using Wilcoxon signed-rank test (non-parametric data) and paired t-test (parametric data). Statistical significance was set at $p<0.05$. Data analysis was performed using InStat GraphPad 3 software.

Interpretation Criteria

- Insignificant: p-value > 0.05
- Significant: p-value < 0.05 or p-value < 0.01
- Highly Significant: p-value < 0.001

2.8 Safety Monitoring

Adverse events were monitored throughout the study. Laboratory investigations were conducted at baseline and post-treatment to assess safety parameters. Any adverse drug reaction (ADR) was to be reported to the peripheral pharmacovigilance center of PGIA, Jodhpur.

3. RESULTS

3.1 Patient Disposition

Thirty patients were enrolled; all 30 patients (100%) completed the study. No patients withdrew from the study.

3.2 Demographic and Baseline Characteristics

Demographic Characteristics of Study Participants (N=30)

Parameter	Category	Frequency (n)	Percentage (%)
Age (Years)	16-20	2	6.67
	21-25	15	50.00
	26-30	3	10.00
	31-35	10	33.33
Gender	Male	29	96.67
	Female	1	3.33
Religion	Hindu	27	90.00
	Other	3	10.00
Marital Status	Married	9	30.00
	Unmarried	21	70.00
Occupation	Student	23	76.67
	Business	2	6.67
	Doctor/Hospital Staff	2	6.67
	Driver	1	3.33
	Teacher	1	3.33
	Air Force	1	3.33
Diet	Vegetarian	23	76.67
	Mixed	7	23.33
Habitat	Urban	18	60.00
	Rural	12	40.00
Socioeconomic Status	Poor	1	3.33
	Middle Class	27	90.00
	Upper Class	2	6.67

The majority of patients were in the 21-25 years age group (50.00%), male (96.67%), Hindu (90.00%), unmarried (70.00%), students (76.67%), vegetarian (76.67%), urban residents (60.00%), and from middle socioeconomic class (90.00%).

3.3 Ayurvedic Constitutional Assessment

Ayurvedic Parameters (N=30)

Parameter	Category	Frequency (n)	Percentage (%)
Agni	Madhyama	8	26.67
	Tikshna	22	73.33
Koshtha	Mridu	6	20.00
	Madhyama	14	46.67
	Krura	10	33.33
Nidra	Alpa	1	3.33
	Madhyama	2	6.67
	Adhika	27	90.00
Sharirika Prakriti	Vata-Kapha	16	53.33
	Kapha-Pitta	10	33.33
	Vata-Pitta	4	13.33
Manasika Prakriti	Rajasika	9	30.00
	Tamasika	21	70.00
Sara	Avara	11	36.67
	Madhyama	13	43.33
	Pravara	6	20.00
Samhanana	Avara	12	40.00
	Madhyama	9	30.00
	Pravara	9	30.00
Satmya	Avara	13	43.33
	Madhyama	9	30.00
	Pravara	8	26.67
Satva	Avara	21	70.00
	Madhyama	6	20.00
	Pravara	3	10.00
Abhyavarana Shakti	Madhyama	6	20.00
	Pravara	24	80.00
Vyayama Shakti	Avara	14	46.67
	Madhyama	14	46.67
	Pravara	2	6.67
Ahara Jarana Shakti	Avara	24	80.00
	Madhyama	6	20.00

Tikshna Agni (73.33%), *Adhika Nidra* (90.00%), *Vata-Kapha Prakriti* (53.33%), *Tamasika Manasika Prakriti* (70.00%), *Avara Satva* (70.00%), and *Avara Ahara Jarana Shakti* (80.00%) were predominant among the study population.

3.4 Clinical Presentations

Site and Duration of Lesion (N=30)

Parameter	Category	Frequency (n)	Percentage (%)
Site of Lesion	Temporal Region	20	66.67
	Parietal Region	10	33.33
Duration of Lesion	1 month	8	26.67
	2 months	10	33.33
	3 months	4	13.33
	4 months	1	3.33
	6 months	6	20.00
	8 months	1	3.33

The temporal region was most commonly affected (66.67%), and the majority of patients had lesion duration of 2 months (33.33%).

3.5 Primary Outcome: SALT Score

Effect of Therapy on SALT Score (N=30)

Parameter	BT (Mean ± SD)	AT (Mean ± SD)	Mean Difference	% Relief	Significance
SALT Score	19.83 ± 2.09	9.60 ± 1.71	10.23	51.4%	$p<0.001$

Wilcoxon signed-rank test

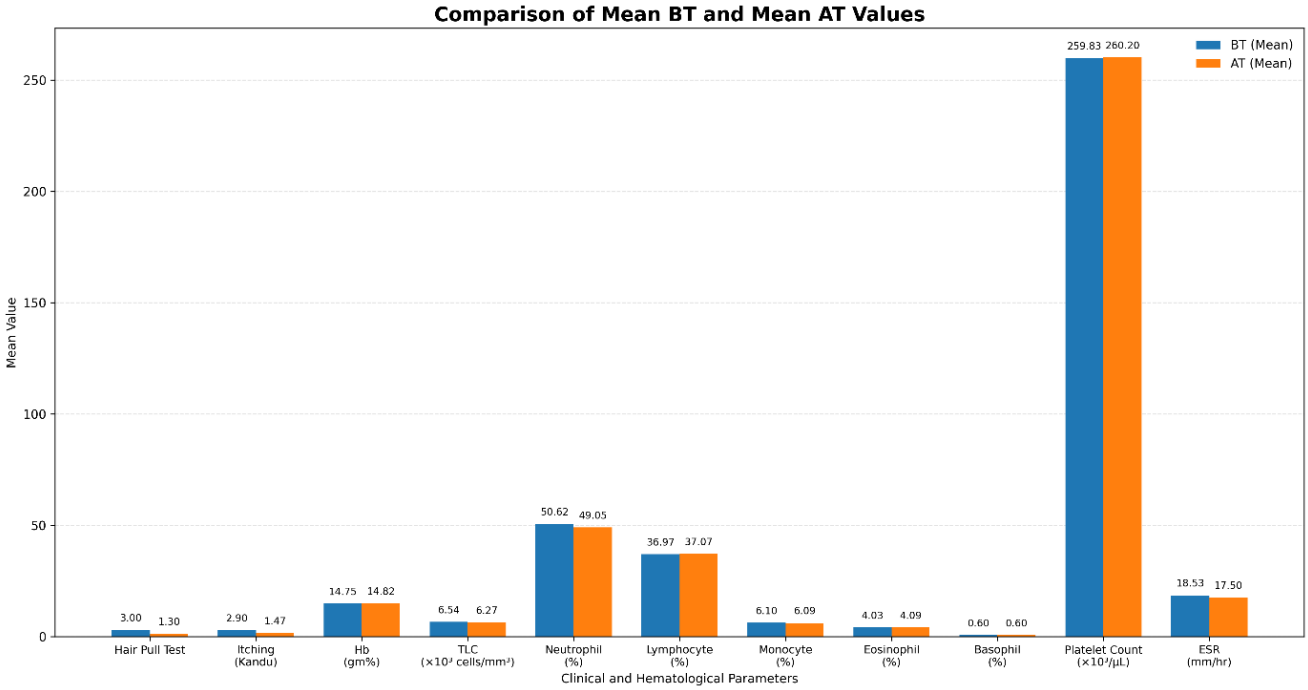
SALT Score showed a highly significant reduction from 19.83±2.09 (baseline) to 9.60±1.71 (post-treatment), with a mean reduction of 10.23 (51.4% improvement, p<0.001).

3.6 Secondary Outcomes

Effect of Therapy on Objective Parameters (N=30)

Parameter	BT (Mean ± SD)	AT (Mean ± SD)	Mean Diff	% Improvement	Test	p-value
Hair Pull Test	3.00 ± 0.64	1.30 ± 0.70	1.70	55.83%	Wilcoxon	<0.001
Itching (Kandu)	2.90 ± 0.71	1.47 ± 0.78	1.43	49.43%	Wilcoxon	<0.001
Hb (gm%)	14.75 ± 1.26	14.82 ± 1.17	+0.07	1.02%	Paired t-test	>0.05
TLC (×10³ cells/mm³)	6.54 ± 1.34	6.27 ± 1.28	0.27	4.13%	Paired t-test	<0.001
Neutrophil (%)	50.62 ± 6.42	49.05 ± 6.22	1.57	3.10%	Paired t-test	<0.001
Lymphocyte (%)	36.97 ± 5.20	37.07 ± 5.24	+0.09	0.25%	Paired t-test	0.113
Monocyte (%)	6.10 ± 1.47	6.09 ± 1.47	0.01	0.16%	Paired t-test	>0.05
Eosinophil (%)	4.03 ± 3.25	4.09 ± 3.28	+0.06	1.49%	Paired t-test	>0.05
Basophil (%)	0.60 ± 0.28	0.60 ± 0.29	0.00	0.00%	Paired t-test	>0.05
Platelet Count (×10³/µL)	259.83 ± 46.07	260.20 ± 46.10	+0.37	0.14%	Paired t-test	0.110
ESR (mm/hr)	18.53 ± 9.26	17.50 ± 9.62	1.03	5.58%	Paired t-test	0.119

Note: BT: Before Treatment; AT: After Treatment; SD: Standard Deviation; S: Significant; NS: Not Significant

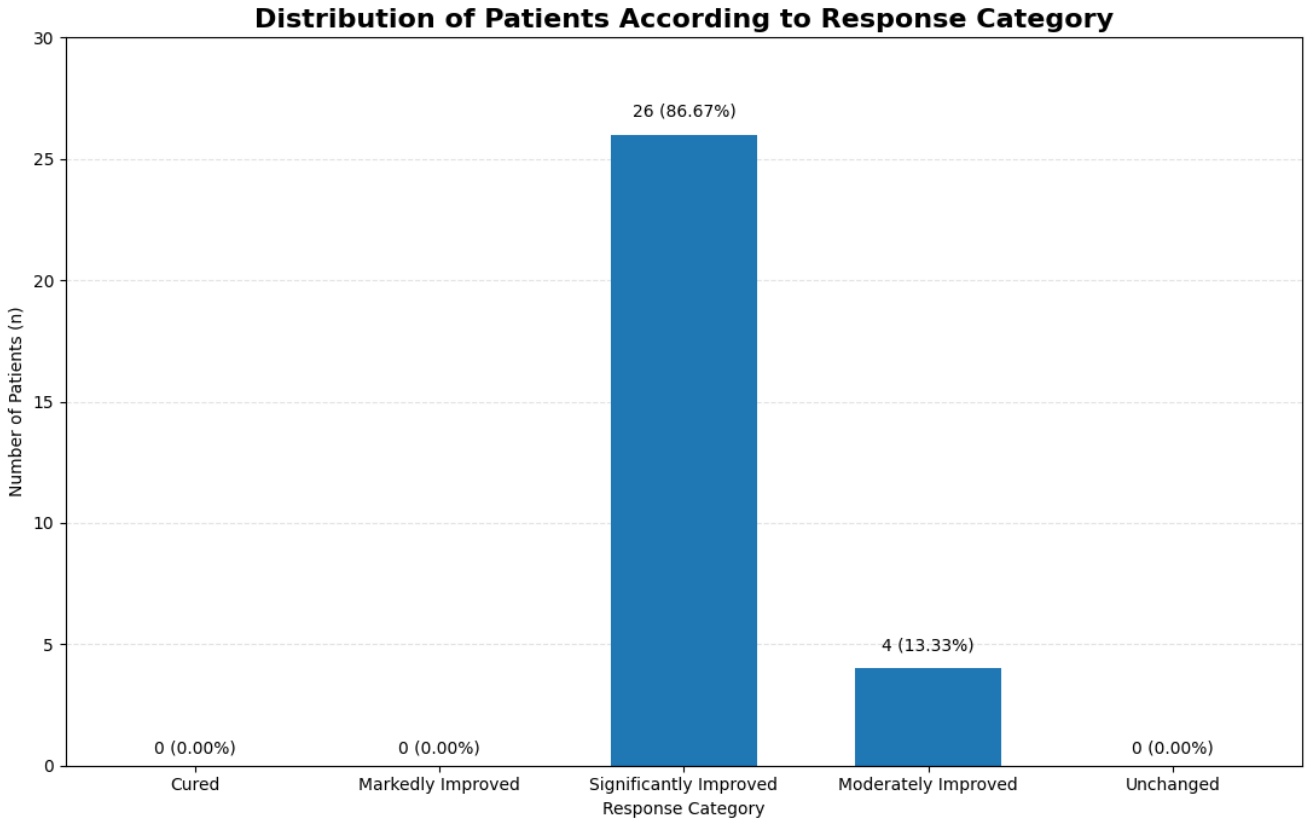


The Hair Pull Test showed a highly significant improvement from 3.00±0.64 to 1.30±0.70 (55.83%, p<0.001). Itching (*Kandu*) improved from 2.90±0.71 to 1.47±0.78 (49.43%, p<0.001). Total Leukocyte Count and Neutrophil count showed statistically significant improvement (p<0.001). Hemoglobin, lymphocyte, monocyte, eosinophil, basophil, platelet count, and ESR showed non-significant changes.

3.7 Overall Therapeutic Outcome

Overall Therapeutic Response

Category	Criteria	n	%
Cured	100% relief	0	0%
Markedly Improved	>75% relief	0	0%
Significantly Improved	50-75% relief	26	86.67%
Moderately Improved	25-50% relief	4	13.33%
Unchanged	<25% relief	0	0%



Out of 30 patients, 26 patients (86.67%) showed significant improvement (50-<75% relief), while 4 patients (13.33%) showed moderate improvement (25-<50% relief). No patient exhibited mild relief (<25%) or complete relief (75-100%).

3.8 Safety Assessment

No adverse drug reactions (ADRs) or treatment-related complications were observed during the study period. The therapeutic regimen was found to be safe, well tolerated, and clinically acceptable when administered under proper Ayurvedic supervision.

4. DISCUSSION

4.1 Conceptual Correlation: Indralupta and Alopecia Areata

The present study established a strong clinical correlation between *Indralupta* and Alopecia areata. *Indralupta*, characterized by sudden, localized, non-scarring hair loss with well-defined bald patches, closely parallels the clinical manifestations of Alopecia areata [9]. The pathogenesis of *Indralupta* involves vitiation of *Vata* and *Pitta* leading to hair fall, followed by obstruction of *Romakupa* (hair follicles) by *Kapha* and *Rakta*, preventing hair regrowth [9]. This dual mechanism of hair shedding and follicular obstruction explains the characteristic bald patches observed in both *Indralupta* and Alopecia areata.

The predominance of *Vata-Kapha Prakriti* (53.33%) in the study population supports the classical Ayurvedic understanding of *Indralupta* as a disorder with significant involvement of *Vata* and *Kapha Dosha*. The presence of *Tikshna Agni* (73.33%) suggests increased *Pitta* activity, which may contribute to the aggravation of *Pitta Dosha* and its role in hair fall [20]. Similarly, the predominance of *Adhika Nidra* (90.00%) and *Avara Satva* (70.00%) indicates lifestyle and psychological factors that may influence disease manifestation [21].

4.2 Role of Dushivisha in Pathogenesis

The concept of *Dushivisha* provides a broader explanation for the chronic and recurrent nature of *Indralupta*. *Dushivisha* refers to a residual or latent form of poison that remains in the body for a prolonged period due to incomplete elimination or continuous exposure to incompatible dietary habits, environmental pollutants, preservatives, pesticides, stress, and other toxic substances [12,13].

From the modern medical perspective, Alopecia areata is considered an autoimmune disorder characterized by T-lymphocyte-mediated destruction of actively growing hair follicles [22]. The collapse of immune privilege around the hair follicle results in inflammatory cell infiltration, interruption of the normal hair growth cycle, and premature transition of hair follicles from the anagen phase to the catagen and telogen phases [23]. Recent evidence also suggests that oxidative stress, chronic inflammation, genetic susceptibility, and environmental triggers play important roles in disease initiation and progression [24].

Interestingly, many of these modern pathogenic mechanisms show remarkable similarity with the Ayurvedic concept of *Dushivisha*. Chronic accumulation of latent toxins, impairment of tissue metabolism, persistent low-grade inflammation, and gradual destruction of normal tissues described in Ayurveda may be correlated with oxidative stress, immune dysregulation, and chronic inflammatory processes recognized by modern science [25]. Therefore, the concept of *Dushivisha* provides a plausible Ayurvedic explanation for the multifactorial pathogenesis of *Indralupta*.

In the present study, the majority of patients were exposed to several factors capable of producing chronic systemic toxicity: irregular dietary habits, consumption of incompatible food combinations (*Viruddha Ahara*), processed foods, environmental pollution, psychological stress, and disturbed sleep. These factors gradually impair *Agni*, resulting in the formation of *Ama* and subsequently *Dushivisha* [12,13]. The chronic and relapsing nature of Alopecia areata also supports this interpretation, as many patients experience repeated episodes of hair loss despite receiving conventional treatment, suggesting that the underlying pathological process continues even after the visible lesions improve [26].

4.3 Mechanism of Action of Combined Therapy

Probable Mode of Action of Dhaturadi Taila

Dhaturadi Taila possesses predominantly *Tikta* and *Katu Rasa*, *Laghu*, *Tikshna*, and *Ushna Guna*, *Ushna Veerya*, and *Katu Vipaka*. These properties collectively alleviate *Kapha* and *Vata*

Dosha, remove *Srotorodha*, and improve local circulation in the scalp [27]. Regular *Shiro Abhyanga* enhances the penetration of medicated oil through the scalp. The lipid medium facilitates deeper absorption of active phytoconstituents, nourishes hair follicles, and improves circulation around the *Romakupa*, thereby enhancing oxygen and nutrient supply to dormant follicles and promoting hair regeneration [28].

The *Vishaghna* property of *Dhaturadi Taila* helps minimize the pathological effects of *Dushivisha* localized in the scalp. By reducing *Kapha*-induced *Srotorodha* and restoring the normal function of *Romakupa*, it supports healthy hair growth. Continuous scalp massage improves microcirculation, relaxes scalp musculature, enhances tissue perfusion, and reduces psychological stress, an important precipitating factor in Alopecia areata [29].

Dhatura (*Datura metel*), the principal ingredient, possesses *Tikshna*, *Ushna*, and *Kaphahara* properties that help remove obstruction of the *Romakupa* caused by aggravated *Kapha*. It also exhibits *Shothahara* and *Vedanasthapana* actions, which help reduce local inflammation. Modern studies have reported anti-inflammatory, antioxidant, and antimicrobial activities of *Dhatura*, supporting its role in improving scalp health and promoting hair follicle regeneration [30]. *Tila Taila* (*Sesamum indicum*), an excellent *Sneha Dravya*, nourishes the scalp and hair follicles, improves local circulation, and enhances the penetration of active constituents. Its emollient, antioxidant, and anti-inflammatory activities help maintain scalp health, reduce dryness, and create a favourable environment for healthy hair growth [31].

Probable Mode of Action of Brihatyadi Lepa

Brihatyadi Lepa possesses predominantly *Katu* and *Tikta Rasa*, *Laghu* and *Tikshna Guna*, *Ushna Veerya*, and *Katu Vipaka*. These properties help alleviate aggravated *Kapha* and *Vata Dosha*, remove *Srotorodha* from *Romakupa*, improve local metabolism, and stimulate dormant hair follicles [18].

Brihati (*Solanum indicum*) is described as *Kaphahara* and *Shothahara*. It helps reduce local inflammation, restores normal tissue metabolism, and supports a healthy environment for hair follicle function [32]. *Dhatura Patra* (*Datura metel*) possesses *Tikshna* and *Ushna* properties that enhance local blood circulation, facilitate deeper penetration of the formulation, and relieve obstruction around the hair follicles. Purified *Gunja* (*Abrus precatorius*) acts as a mild local irritant and follicular stimulant. It enhances scalp blood circulation, activates dormant hair follicles, and promotes initiation of new hair growth [33].

According to Ayurveda, *Kapha* and *Rakta* obstruction at the *Romakupa* prevents normal hair emergence. Regular application of *Brihatyadi Lepa* removes this obstruction, restores follicular integrity, and facilitates healthy hair growth. The *Lepana* procedure ensures prolonged contact of the medicated paste with the scalp, increasing local absorption of active constituents and enhancing therapeutic efficacy [34].

Probable Mode of Action of Yashtimadhu Taila Nasya

Nasya Karma is considered one of the principal therapies for *Urdhvajatrugata Roga* (diseases affecting the head and neck region) [35]. Since *Indralupta* affects the scalp and hair follicles in the cranial region, administration of *Yashtimadhu Taila* through the nasal route provides both local and systemic therapeutic effects by eliminating vitiated *Dosha*, nourishing tissues, and restoring normal scalp physiology [19].

Yashtimadhu Taila possesses predominantly *Madhura Rasa*, *Guru* and *Snigdha Guna*, *Sheeta Veerya*, and *Madhura Vipaka*. These properties impart *Rasayana*, *Balya*, *Vranaropana*, and *Keshya* actions, nourishing tissues, pacifying aggravated *Vata* and *Pitta*, and improving the quality of *Rasa* and *Rakta Dhatu* essential for healthy hair growth [36].

According to Ayurveda, "Nasa Hi Shiraso Dwaram" (the nose is the gateway to the head). Medicines administered through the nasal cavity reach the *Shringataka Marma* and spread through various channels of the head, eliminating vitiated *Dosha*, nourishing tissues, and restoring normal physiological functions of the scalp [35]. The richly vascular nasal mucosa facilitates rapid absorption of lipid-soluble phytoconstituents. Certain active constituents may also reach the central nervous system through the olfactory pathway, thereby enhancing both local and systemic therapeutic effects [37]. By influencing neuroendocrine and autonomic functions, *Nasya Karma* may reduce psychological stress, a recognized precipitating factor in Alopecia areata. Regulation of stress-induced immune dysfunction indirectly supports hair regrowth [29].

Yashtimadhu (*Glycyrrhiza glabra*) possesses *Rasayana*, *Varnya*, *Raktaprasadana*, and tissue-rejuvenating properties. It promotes tissue repair, enhances scalp nourishment, supports regeneration of healthy hair follicles, and improves the therapeutic efficacy of the medicated oil. Modern studies have demonstrated its antioxidant, anti-inflammatory, and immunomodulatory activities, which help protect hair follicles from immune-mediated damage and oxidative stress [38]. *Amalaki* (*Phyllanthus emblica*), a well-known *Rasayana* drug with *Tridoshahara*, especially *Pittahara*, properties, nourishes the scalp and hair follicles, promotes healthy *Keshya*, and supports tissue regeneration. Rich in natural antioxidants, it protects hair follicles from oxidative stress and helps maintain normal hair growth [39].

4.4 Therapeutic Efficacy

SALT Score Improvement

The significant reduction in SALT Score (51.4%, $p<0.001$) demonstrates the combined effectiveness of systemic detoxification (*Yashtimadhu Taila Nasya* and *Dhaturadi Taila*) and local symptom management (*Dhaturadi Taila* and *Brihatyadi Lepa*). The mean SALT Score decreased from 19.83±2.09 to 9.60±1.71, indicating substantial hair regrowth and marked reduction in disease severity. This improvement exceeds or matches many conventional treatments in reducing clinical severity while avoiding adverse effects [40].

Hair Pull Test Improvement

The 55.83% improvement in Hair Pull Test ($p<0.001$) indicates a considerable reduction in active hair shedding and improved stability of hair roots. This reflects the strengthening of hair follicles and the transition of hair cycles from the telogen (resting) phase to the anagen (growth) phase [23].

Itching (Kandu) Improvement

The 49.43% improvement in itching ($p<0.001$) suggests that the treatment protocol effectively relieved scalp itching and improved patient comfort. Itching in Alopecia areata is associated with perifollicular inflammation and immune cell infiltration [22]. The reduction in itching indicates anti-inflammatory and immunomodulatory effects of the combined therapy.

Hematological Parameters

The statistically significant improvement in Total Leukocyte Count (TLC: 4.13%, $p<0.001$) and Neutrophil count (3.10%, $p<0.001$) suggests a reduction in inflammatory response associated with the disease. However, the clinical significance of these changes requires further evaluation. Hemoglobin, lymphocyte, monocyte, eosinophil, basophil, platelet count, and ESR showed non-significant changes, indicating that the treatment did not produce any undesirable systemic effects [41].

4.5 Role of Dushivisha in the Study Population

The observational data support the role of *Dushivisha* in the pathogenesis of *Indralupta*:

Age Distribution: The predominance of patients in the 21-25 years age group (50.00%) suggests that young adults, commonly exposed to psychological stress, irregular dietary habits, and environmental factors, are more susceptible. From the modern perspective, Alopecia areata is also reported to occur more frequently during the second and third decades of life [42].

Dietary and Lifestyle Factors: The majority of patients had *Tikshna Agni* (73.33%), *Adhika Nidra* (90.00%), and *Avara Satva*

(70.00%). These factors indicate *Pitta* predominance, disturbed sleep patterns, and reduced mental resilience, all of which may contribute to *Doshia* imbalance and facilitate the manifestation of *Indralupta* [21].

Psychological Factors: The predominance of *Tamasika Manasika Prakriti* (70.00%) and *Avara Satva* (70.00%) suggests that most patients had reduced mental strength and ability to cope with stress. Since emotional stress is considered one of the important triggering factors in Alopecia areata [24], the predominance of these constitutional types indicates that psychological factors may have contributed to the onset or aggravation of *Indralupta* in the present study.

Environmental Factors: The higher proportion of urban residents (60.00%) suggests exposure to higher levels of pollution, psychological stress, sedentary lifestyle, and irregular food habits, all of which may contribute to the accumulation of *Dushivisha* and the development of *Indralupta* [13].

4.6 Safety and Tolerability

The absence of adverse reactions during the 60-day study confirms the safety of *Dhaturadi Taila*, *Brihatyadi Lepa*, and *Yashtimadhu Taila Nasya*. The inclusion of *Gunja* (*Abrus precatorius*) and *Dhatura* (*Datura metel*) in the formulations, processed through proper pharmaceutical procedures, demonstrates the importance of classical purification (*Shodhana*) in ensuring safety while maintaining therapeutic efficacy [43]. Routine laboratory investigations remained within physiological limits before and after treatment without any statistically significant adverse alterations, indicating that the therapeutic regimen did not produce any undesirable systemic effects [41].

4.7 Limitations

The present study had several limitations:

- Exploratory single-arm design without control group
- Relatively small sample size (n=30)
- Short duration (60 days) without long-term follow-up
- Lack of blinding
- Absence of placebo control
- No assessment of immunological biomarkers

5. CONCLUSION

This exploratory single-arm study provides substantial evidence that *Dhaturadi Taila*, *Brihatyadi Lepa*, and *Yashtimadhu Taila Nasya* are effective and safe in managing *Indralupta* (Alopecia areata). Key conclusions include:

- **Significant Clinical Improvement:** 51.4% reduction in SALT Score ($p<0.001$), with 86.67% of patients showing significant improvement (50-<75% relief).
- **Reduction in Active Hair Fall:** 55.83% improvement in Hair Pull Test ($p<0.001$), indicating reduced active hair shedding and improved hair root stability.
- **Relief from Itching (*Kandu*):** 49.43% improvement in itching ($p<0.001$), indicating reduced perifollicular inflammation and improved patient comfort.
- **Safety Confirmation:** No adverse reactions and maintenance of normal hematological and biochemical parameters confirm excellent safety and tolerability.
- **Validation of Ayurvedic Concepts:** Clinical observations validate the role of *Dushivisha*, *Agnimandya*, *Dosha* vitiation, and *Srotorodha* in *Indralupta* pathogenesis, supporting classical Ayurvedic understanding.
- **Holistic Approach:** The combined approach of local scalp therapy and systemic *Nasya* addresses both local pathology and systemic causative factors, offering an effective alternative to conventional treatments with their associated adverse effects.
- **Therapeutic Principle:** Pacification of vitiated *Doshas*, removal of follicular obstruction (*Srotorodha*), elimination of *Dushivisha*, and restoration of healthy hair growth constitute the fundamental therapeutic principles validated by this study.

Limitations and Recommendations

- Exploratory single-arm design without control group
- Relatively small sample size (n=30)
- Short duration (60 days) without long-term follow-up
- Need for larger randomized controlled trials
- Assessment of immunological and inflammatory biomarkers recommended
- Longer follow-up studies to assess recurrence rates
- Multicentric studies to confirm reproducibility

The null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted: ***Dhaturadi Taila*, *Brihatyadi Lepa*, and *Yashtimadhu Taila Nasya* are effective in the management of *Indralupta* (Alopecia areata)**.

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