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A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFICACY OF THUMBI TAILA AND AMRITADYA TAILA MARSHA NASYA FOLLOWED BY PRATIMARSHA NASYA IN THE MANAGEMENT OF HYPOTHYROIDISM

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ABSTRACT

Background and Objective: Hypothyroidism is a hypometabolic disorder due to deficient thyroid hormone production and is among the most common endocrine diseases worldwide. Ayurveda correlates it with Kapha–Vata dosha imbalance, Jatharagni dushti, and Dhatwagnimandya leading to metabolic slowdown and symptoms like weight gain, fatigue, constipation, and hair fall. As the thyroid lies in the Urdhva Jatrugata region, Nasya Karma is considered a prime therapy. This study evaluated and compared the efficacy of Thumbi Taila and Amritadya Taila Nasya. **Methods:** A comparative pre- and post-test clinical trial was conducted on 40 diagnosed hypothyroid subjects. Intervention And Duration Group A received Marsha Nasya followed by Pratimarsha Nasya with Thumbi Taila. Group B received the same protocol with Amritadya Taila for 28 days (7 days Marsha, 21 days Pratimarsha). **Results:** Both groups showed significant

improvement in TSH, Free T4, and Zulewski clinical scores, with greater reduction in Group A. Interpretation And **Conclusion** Nasya therapy effectively managed hypothyroidism; Thumbi Taila showed superior benefit, likely due to Vata–Kapha shamana and Agnideepana effects.

KEYWORDS: Hypothyroidism, Nasya Karma, Thumbi Taila, Amritadya Taila, Kapha–Vata, Agnimandya.

INTRODUCTION

Hypothyroidism is a hypometabolic endocrine disorder characterized by inadequate production of thyroid hormones, leading to systemic metabolic slowdown, weight gain, fatigue, constipation, dry skin, hair fall, and menstrual irregularities.[1] The prevalence of hypothyroidism in India is 11%, compared with only 2% in the UK and 4·6% in the USA.[2]

The clinical features of hypothyroidism closely resemble the manifestations of Vata-Kapha Dushti, Agnimandya.[3] and Rasapradoshaja Vikara[4] described in Ayurveda, where impaired Jatharagni and Dhatvagni result in diminished tissue metabolism and Kapha accumulation. The thyroid gland, situated in the Urdhva Jatrugata Bhaga, is governed predominantly by Vata and Kapha Doshas, and their vitiation leads to a state of hypometabolism comparable to conditions explained under Galaganda and Kaphaja Nanatmaja Vikara.[5] If not managed appropriately, this Dosha imbalance progresses to chronic metabolic suppression affecting multiple Dhatus.

Nasya Karma is considered the most effective therapy for Urdhvajatrugata Vyadhis, as it facilitates the elimination and pacification of vitiated Doshas from the cranial region while restoring systemic balance. Marsha Nasya, a Shodhana type of Nasya, provides deep purification and clears Srotorodha, whereas Pratimarsha Nasya serves as a gentle Shamana therapy, promoting long-term Dosha equilibrium and nourishment. The nasal route also enables direct influence over higher neuroendocrine centers, potentially modulating the hypothalamic–pituitary–thyroid (HPT) axis and aiding metabolic regulation.

Thumbi Taila.[6] possessing Lekhana, Medohara, Deepana, and Kapha-Vatahara properties, helps reduce Kapha accumulation, improve Agni, and enhance metabolic activity, thereby alleviating obesity, lethargy, and constipation. Amritadya Taila[7], enriched with Medhya Rasayana and Ojas-vardhaka Dravyas, exhibits Vata-Kapha Samana and Rasayana effects,

supporting neuroendocrine balance and systemic rejuvenation. Both formulations are suitable for Nasya Karma aimed at correcting Agnimandya and Kapha predominance.

Hence, this study was undertaken to evaluate and compare the efficacy of Marsha Nasya followed by Pratimarsha Nasya with Thumbi Taila and Amritadya Taila in the management of hypothyroidism, assessing their role in Dosha Samana, Agni Deepana, and restoration of metabolic homeostasis through clinical and biochemical parameters.

MATERILAS AND METHODS

SOURCE OF DATA

Subjects for the study will be selected incidentally from the OPD and IPD of Government Ayurveda Medical College and Hospital, Mysuru and Government Hi -Tech Panchakarma Hospital, Mysuru.

Subjects will also be selected from special camps proposed for the purpose.

SOURCE OF DRUGS

Required formulations for the study will be specifically prepared for the purpose and procured from a Good Manufacturing practices certified Ayurveda Pharmacy.

METHODS OF COLLECTION OF DATA

SCREENING

- Irrespective of gender, patients attending the OPD and IPD will be selected at random without bias of social, economic, educational or religious status.

DIAGNOSTIC CRITERIA

Subjects with signs and symptoms of Hypothyroidism along with Thyroid function test report suggestive of Hypothyroidism.

INCLUSION CRITERIA

1. Subjects belonging to age group 18 to 60 years irrespective of gender.
2. Both fresh and treated cases of Hypothyroidism.

- Definition of fresh cases include freshly detected and untreated cases of Hypothyroidism.
- Definition of treated cases include already diagnosed and treated cases of Hypothyroidism. **(**If subjects are on hormonal therapy, the same treatment will be continued, along with my study**)**.

3. Subjects fit for *Nasya Karma.*
4. Subjects with the TSH value >4.5mIU/L.
5. Subjects who are willing to give the consent.

EXCLUSION CRITERIA

1. Subjects diagnosed with cardiac disorders, thyrotoxicosis, congenital anomalies, carcinomas of the thyroid gland, secondary Hypothyroidism, Post –operative hypothyroidism and Hypothyroidism with post radio-iodine therapy.
2. Subjects having any of the diagnosed systemic illnesses which interrupt with present intervention.
3. Pregnant and lactating women.

LABORATORY INVESTIGATION

- Thyroid profile (TSH, T_3 & T_4) will be done before and after the intervention.
- Free Thyroxine test or FT4.
- CBC.
- Other relevant investigations will be done if found necessary.

STUDY DESIGN

A Comparative Clinical Study with Pre and Post-treatment assessment.

PLAN OF STUDY

- **GROUPING**: Subjects will be made into 2 groups, using purposive sampling technique.
- **SAMPLE SIZE**: Total sample size consists minimum of 40 subjects, each group will be consisting a minimum of 20 Subjects.
- Group-A: *Marsha Nasya* followed by *Pratimarsha Nasya* with *Thumbi Taila*.
- Group-B: *Marsha Nasya* followed by *Pratimarsha Nasya* with *Amrithadya Taila.*

MARSHA NASYA

Table 1: The following same procedure will be followed for both the groups.

	Group A	**Group B**
Poorvakarma	*Deepana Pachana* with *Chitrakadi Vati* 250mg BD before food with luke warm water till attainment of *Nirama Lakshana*. *Sthanika Abyanga* to *Urdhvajathru* with *Kshreerabala Taila* and *Pata*	*Deepana Pachana* with *Chitrakadi Vati* 250mg BD before food with luke warm water till attainment of *Nirama Lakshana*. *Sthanika Abyanga* to *Urdhvajatru* with *Kshreerabala Taila* and *Pata*

	Swedha will be done.	*Swedha* will be done.
Pradhanakarma	*Nasya* with *Thumbi Taila* -4 *Bindu*, (2ml) in each nostril for 7 days, on empty stomach.	*Nasya* with *Amritadya Taila* - *4Bindu* , (2ml) in each nostril for 7 days, on empty stomach.
Pashchat Karma	*Kavala* with *Ushnajala*. Followed by *Dhumapana* with *Haridra Varti*.	*Kavala* with *Ushnajala* Followed by *Dhumapana* with *Haridra Varti*.

PRATIMARSHA NASYA KARMA

From 8th To 28th Day

For 21days

Table 2: Pratimarsha nasya karma in intervention.

GROUP A - *Prati Marsha Nasya Karma* with *Thumbi Taila*	**GROUP B - *Prati Marsha Nasya Karma* with *Amritadya Taila*.**
PROCEDURE Subject is advised to instsill 2 bindus of *Pratimarsha Nasya*, 1 bindu in each nostril by *Thumbi Tailla*. DURATION For 21 days continuously.	**PROCEDURE** Subject is advised to instill 2 bindus of *Pratimarsha Nasya*, 1 bindu in each nostril by *Amruthadi Taila*. DURATION For 21 days continuously.

STUDY DURATION: 60 DAYS

ASSESSMENT SCHEDULE:

- Pre-test assessment – 0th day
- Post-test assessment – 29th day
- Follow up – 60th day

ASSESSMENT CRITERIA

Assessment will be based on the subjective and objective parameters before and after the treatment.

A. SUBJECTIVE PARAMETERS

Table 3: ZULEWSKI'S CLINICAL SCORE FOR HYPOTHYROIDISM.

On the basis of	**New score**	
Symptoms Present	**Absent**	
1. Diminished sweating	1	0
2. Hoarseness	1	0
3. Dry skin	1	0
4. Constipation	1	0
5. Weight increase	1	0
6. Paresthesia	1	0

7. Impairment of hearing	1	0
Physical signs		
1. Coarse skin	1	0
2. Cold skin	1	0
3. Periorbital puffiness	1	0
4. Slow movements	1	0
5. Delayed ankle reflex	1	0

Sum of all symptoms and signs present: 12.

A score of >5 points define Hypothyroidism, while a score of 0-2 points define Euthyroidism.

- It will be assessed before the treatment, after the treatment and after the follow up.

B. OBJECTIVE PARAMETERS

- Serum TSH (Thyroid Stimulating Hormone).
- Serum Free T4.

❖ It will be assessed before treatment and after the treatment.

ASSESSESMENT OF CLINICAL IMPROVEMENT:

The sum point of all the parameters of assessment before, after and after follow up will be taken into consideration to assess the total effect of the treatment as follows.

OVERALL ASSESSMENT

Overall assessment will be based on improvement in Subjective and Objective Parameters. The results will be categorized as.

Table 4 : Overall assessment.

Complete relief	100 % relief from complaints
Marked relief	More than 75 % relief from complaints
Moderate relief	50 -74 % relief from complaints
Mild relief	25-49 % relief from complaints
No relief	Less than 25 % relief of complaints

- **STATISTICAL METHOD**

The results will be compared and analysed by using following statistical methods.

Tabel 5: Statistical method.

Descriptive	Non parametric	Parametric
Mean Standard deviation Frequency Percent	Chi-Square test Wilcoxon signed rank test. Mann Whitney U test	T tests- Independent and Paired samples. Repeated measure ANOVA

- All the statistical Operations will be done through service product for Statistical Solutions (SSPS) for Windows V28 Software.

OBSERVATIONS AND RESULTS

1. Tiredness

Before treatment, tiredness was present in 36 subjects (90%), including 18 (90%) in Group A and 18 (90%) in Group B.

After treatment, tiredness persisted in only 1 subject (5%) in Group A and none (0%) in Group B. Both groups showed statistically highly significant improvement ($p = 0.0001$), with no significant intergroup difference ($p = 1.0000$).

The improvement may be attributed to the **Deepana–Pachana** action of Chitrakadi Vati and Nasya drugs such as **Pippali, Shunthi, and Vidanga**, which enhance Agni and cellular metabolism, thereby reducing lethargy.

2. Dry Skin

Before treatment, dry skin was observed in 38 subjects (95%) — 20 (100%) in Group A and 18 (90%) in Group B.

After treatment, complete relief was seen in Group A (100%), while 2 subjects (10%) in Group B continued to report dryness. Improvement was highly significant in both groups ($p = 0.0001$), with no intergroup difference ($p = 0.4870$).

The **Snigdha and Rasayana** properties of **Tila Taila, Bala, and Guduchi** likely improved tissue hydration and nourishment.

3. Cold Intolerance

Before treatment, 39 subjects (97.5%) had cold intolerance (Group A: 100%; Group B: 95%).

After treatment, all subjects in Group A (100%) and 19 subjects (95%) in Group B were relieved. Both groups showed highly significant improvement ($p = 0.0001$), with no intergroup difference ($p = 1.0000$).

This may be due to **Ushna Virya** drugs such as **Shunthi, Maricha, Pippali, and Chitraka**, which enhance metabolic heat and counter Kapha dominance.

4. Hair Loss

Before treatment, hair loss was present in 37 subjects (92.5%) — all in Group A (100%) and 17 (85%) in Group B.

After treatment, complete resolution occurred in Group A (100%), whereas 7 subjects (35%) in Group B remained symptomatic. Improvement was significant in both groups (Group A: p = 0.0001; Group B: p = 0.0020). Intergroup difference post-treatment was significant (p = 0.0040), favoring Group A.

Bala, Atibala, Guduchi, and Tila Taila possess **Rasayana and Balya** properties supporting hair growth.

5. Constipation

Before treatment, constipation was present in 26 subjects (65%) — 14 (70%) in Group A and 12 (60%) in Group B.

After treatment, constipation persisted in 3 subjects (15%) in Group A and 9 subjects (45%) in Group B. Improvement was significant in Group A (p = 0.0030) but not in Group B (p = 0.2500). Intergroup difference was significant (p = 0.0380).

Hingu, Ajamoda, Pippali, and Ushna Jala exhibit Anulomana and Vatanulomana actions that relieve bowel sluggishness.

6. Weight Gain

Before treatment, 37 subjects (92.5%) reported weight gain (Group A: 100%; Group B: 85%).

After treatment, only 2 subjects (10%) in Group A and 9 subjects (45%) in Group B continued to report weight gain. Both groups showed highly significant improvement (p = 0.0001). Intergroup difference was significant (p = 0.0130), favoring Group A.

Lekhana and Medohara drugs such as Chitraka, Vidanga, Yavakshara, and Sarshapa may have reduced Meda accumulation.

7. Poor Appetite

Before treatment, poor appetite was present in 39 subjects (97.5%) — 19 (95%) in Group A and 20 (100%) in Group B.

After treatment, only 2 subjects (10%) in each group continued to report poor appetite. Both groups showed highly significant improvement (p = 0.0001), with no significant intergroup difference (p = 1.0000).

Both groups showed highly significant improvement (*p* = 0.0001) with no intergroup difference.

Deepana drugs stimulated Jatharagni**,** improving appetite.

8. Menstrual Disturbance

Before treatment, menstrual disturbance was noted in 18 subjects (45%), including 13 (65%) in Group A and 5 (25%) in Group B.

After treatment, symptoms persisted in only 2 subjects (10%) in Group A and 3 subjects (15%) in Group B. Improvement was significant in Group A (p = 0.0030) but not in Group B (p = 0.6250).Group A showed significant improvement (*p* = 0.0030), whereas Group B did not (*p* = 0.6250). Baseline intergroup difference was significant, but post-treatment difference was not.

This may relate to Vatahara and Rasayan**a** effects of Bala and Guduchi, regulating Apana Vata.

9. Muscle Ache and Stiffness

Before treatment, symptoms were present in 30 subjects (75%), including 18 (90%) in Group A and 12 (60%) in Group B.

After treatment, only 2 subjects (10%) in Group A and 5 subjects (25%) in Group B reported symptoms. Both groups showed significant improvement (Group A p = 0.0001; Group B p = 0.0390).Both groups improved significantly (Group A: *p* = 0.0001; Group B: *p* = 0.0390). Intergroup comparison was not significant.

Ksheerabala Taila and Tila Taila provided Vatahara and Shothahara effects.

10. Delayed Tendon Reflex

No statistically significant change was observed in either group, indicating deeper neuromuscular involvement requiring longer therapy.

11. Hoarse Voice

Significant improvement occurred in Group A (p = 0.0001) but not in Group B (p = 0.1250). Intergroup comparison was significant (p = 0.0280).

Pippali, Shunthi, and Saindhava exhibit Kanthya and Shothahara actions.

12. Puffiness of Face/Body

No statistically significant improvement was noted in either group, possibly requiring prolonged Medohara therapy.

13. Poor Memory and Concentration

Group B showed significant improvement (p= 0.0040), while Group A did not. This may be due to Medhya Rasayana drugs such as Guduchi and Bala in Amritadya Taila, supporting cognitive function.

Biochemical Parameters

14. Serum TSH

Both groups showed statistically significant reductions in serum TSH (Group A: p = 0.0005; Group B: p < 0.001), with a significant post-treatment intergroup difference (p = 0.0215), indicating improved thyroid function. This effect may be attributed to Nasya Karma, where Marsha Nasya (Shodhana) eliminates vitiated Kapha–Vata Doshas from the Urdhva Jatrugata region and, via nasal absorption, may modulate the hypothalamic–pituitary–thyroid axis, while Pratimarsha Nasya provides sustained Shamana and neuroendocrine stabilization. The formulations contain Deepana–Pachana drugs (Pippali, Shunthi, Chitraka) that enhance Agni and metabolism, along with Kapha-Vatahara, Medohara, and Rasayana agents (Guduchi, Bala) supporting endocrine function. Collectively, this Shodhana–Shamana approach likely corrected Agnimandya, restored metabolic homeostasis, and contributed to TSH reduction.

15. Free T4

Before treatment, the mean Free T4 levels in both Group A and Group B were within comparable ranges, with no statistically significant difference between groups.

After treatment, Group A showed a slight mean decrease of 0.02 ng/dL (1.42% reduction), whereas Group B showed a small mean increase of 0.06 ng/dL (5.23% increase). However, these changes were not statistically significant in either Group A (p = 0.5257) or Group B (p = 0.6009), indicating that Free T4 levels remained largely unchanged during the study

period.No statistically significant change was observed in either group. This suggests that clinical improvement may precede complete hormonal normalization.

16. Zulewski's Clinical Score

Before treatment, the mean Zulewski clinical scores were similar in Group A and Group B, with no significant intergroup difference (p= 0.3648), indicating comparable clinical severity.

After treatment, both groups showed marked clinical improvement. Group A demonstrated a mean reduction of 5.35 points (89.17%), while Group B showed a reduction of 4.15 points (65.87%). The improvement was statistically highly significant within both groups (p = 0.0001). Post-treatment scores were significantly lower in Group A than Group B (p = 0.0010), and the magnitude of improvement was also significantly greater in Group A (p = 0.0027).

Overall, these findings suggest that the treatment administered to Group A was more effective in reducing the clinical manifestations of hypothyroidism as measured by Zulewski's scoring system.

Table 6: Master table of overall observations and treatment outcome (n = 40).

Parameter	Category	Group A (n=20)	Group B (n=20)	Total (%)	p-value
Age	41–50 yrs (most common)	45%	50%	47.5%	0.969
Gender	Female	85%	90%	87.5%	0.633
Religion	Hindu	65%	85%	75%	0.144
Occupation	Business	65%	75%	70%	0.565
Education	Secondary+Graduate	75%	95%	85%	0.086
Locality	Urban	100%	100%	100%	1.000
Marital Status	Married	95%	100%	97.5%	1.000
Fresh/Treated	Treated cases	70%	80%	75%	0.465
SES	Upper/Upper-middle dominant	60%	35%	—	**0.007***
Family History	Present	10%	75%	42.5%	**0.0001***
Marital Status	Married	95%	100%	97.5%	1.000
Fresh/Treated	Treated cases	70%	80%	75%	0.465
SES	Upper/Upper-middle dominant	60%	35%	—	**0.007***
Family History	Present	10%	75%	42.5%	**0.0001***

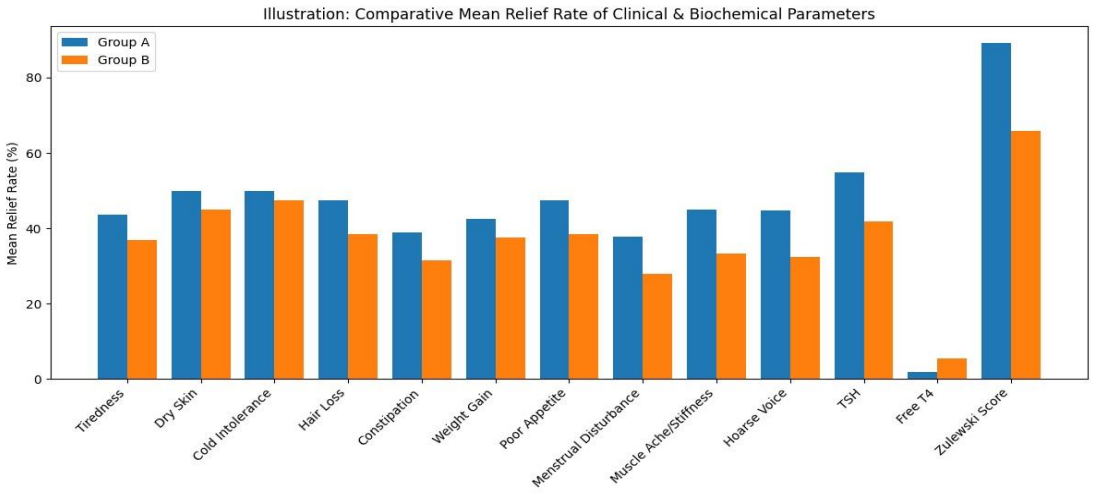
Table 7: Statistical Analysis of Subjective Clinical Symptoms.

Parameter	Group	BT Mean	AT Mean	Mean Difference	Mean Relief Rate (%)	P value	Remarks
Tiredness	A	1.95	1.10	0.85	**43.58% ↓**	<0.05	S
	B	1.90	1.20	0.70	**36.84% ↓**	<0.05	S
Dry Skin	A	2.00	1.00	1.00	**50.00% ↓**	<0.05	S
	B	2.00	1.10	0.90	**45.00% ↓**	<0.05	S
Cold Intolerance	A	2.00	1.00	1.00	**50.00% ↓**	<0.05	S
	B	2.00	1.05	0.95	**47.50% ↓**	<0.05	S
Hair Loss	A	2.00	1.05	0.95	**47.50% ↓**	<0.05	S
	B	1.95	1.20	0.75	**38.46% ↓**	<0.05	S
Constipation	A	1.80	1.10	0.70	**38.89% ↓**	<0.05	S
	B	1.75	1.20	0.55	**31.43% ↓**	>0.05	NS
Weight Gain	A	2.00	1.15	0.85	**42.50% ↓**	<0.05	S
	B	2.00	1.25	0.75	**37.50% ↓**	<0.05	S
Poor Appetite	A	2.00	1.05	0.95	**47.50% ↓**	<0.05	S
	B	1.95	1.20	0.75	**38.46% ↓**	<0.05	S
Menstrual Disturbance	A	1.85	1.15	0.70	**37.84% ↓**	<0.05	S
	B	1.80	1.30	0.50	**27.78% ↓**	>0.05	NS
Muscle Ache/Stiffness	A	2.00	1.10	0.90	**45.00% ↓**	<0.05	S
	B	1.95	1.30	0.65	**33.33% ↓**	<0.05	S
Hoarse Voice	A	1.90	1.05	0.85	**44.74% ↓**	<0.05	S
	B	1.85	1.25	0.60	**32.43% ↓**	<0.05	S

Table 8: Statistical Analysis of Objective Parameters.

Parameter	Group	BT Mean	AT Mean	Mean Difference	Mean Relief Rate (%)	P value	Remarks
TSH (mIU/L)	A	12.99	5.88	7.11	**54.73% ↓**	<0.001	HS
	B	12.95	7.53	5.42	**41.86% ↓**	<0.001	HS
Free T4 (ng/dl)	A	1.16	1.18	+0.02	**1.72% ↑**	>0.05	NS
	B	1.10	1.04	−0.06	**5.45% ↓**	>0.05	NS
Zulewski Clinical Score	A	6.00	0.65	5.35	**89.17% ↓**	<0.001	HS
	B	6.30	2.15	4.15	**65.87% ↓**	<0.001	HS

Illustration 1: Comparative mean relief rate of clinical and biochemical parameters in present study



DISCUSSION

DISCUSSION ON PROCEDURE AND PROBABLE MODE OF ACTION.

1. Rationale for Selecting Nasya Karma

Nasya Karma is the principal therapeutic modality for disorders of the Urdhwajatrugata region**.** The thyroid gland, located in the Greeva pradesha, falls within this anatomical domain. Hypothyroidism in Ayurveda can be understood as a condition involving Kapha–Vata Dushti**,** Agnimandya**,** Ama accumulation, and Rasadhatu dysfunction. Hence, a combination of Shodhana (Marsha Nasya) followed by Shamana–Brimhana (Pratimarsha Nasya**)** was adopted to achieve both Dosha elimination and sustained metabolic correction.

2. Purva Karma (Preparatory Measures)

Deepana–Pachana: Chitrakadi Vati (250 mg twice daily before food) was administered until signs **of** Nirama Avastha were observed. Its Katu–Tikta Rasa, Ushna Veerya, and Deepana–Pachana properties stimulate Jatharagni, digest Ama**,** relieve Kapha dominance, and correct metabolic sluggishness — a core pathology in hypothyroidism. This step ensures improved drug receptivity and metabolic readiness for Shodhana.

Sthanika Abhyanga

Local massage over head and neck with Ksheerabala Taila provided Snigdhata and Mriduta, pacified Vata, enhanced microcirculation, and facilitated Dosha Utklesha. Bala (Balya, Rasayana), Ksheera (Brimhana), and Tila Taila (Vatahara, Sukshma) collectively prepared tissues and improved mucosal permeability.

Sthanika Pata Swedana

Mild sudation liquefied Kapha, relieved stiffness and heaviness, and promoted Srotoshodhana**.** Repeated fomentation (Punah-punaha Sweda) ensured complete Kaphavilayana, mobilizing Doshas toward the nasal route for effective elimination.

4. Pradhana Karma (Marsha Nasya)

Medicated oil (Thumbi Taila in Group A / Amrithadya Taila in Group B) was instilled in **Pravilambita Shiras** posture (neck extension ~45°) in a continuous stream (Avicchinna Dhara, 4 bindu per nostril).

Probable Mechanism of Marsha Nasya

Marsha Nasya acts primarily as Shodhana

- Dosha Elimination**:** Expels vitiated Kapha–Vata from the Urdhwajatrugata region, relieving Srotorodha.
- Intranasal Drug Delivery**:** Lipid-based oil adheres to nasal mucosa and is absorbed via:
  - Olfactory pathway → direct nose-to-brain transport
  - Trigeminal/perineural pathway
  - Vascular–lymphatic absorption
- Neuroendocrine Influence**:** Absorbed molecules may reach the hypothalamus**,** modulating autonomic and neuroendocrine centers. This could influence the Hypothalamic–Pituitary–Thyroid (HPT) axis, aiding normalization of TRH–TSH regulation.
- Metabolic Activation: Ushna–Tikshna qualities counter Kapha, stimulate Agni, improve tissue metabolism, and reduce metabolic inertia.

Thus, Marsha Nasya provides Srotoshodhana + central neuroendocrine stimulation, forming the active detoxifying phase.

4. Paschat Karma

Kavala with warm water and Dhumapana with Haridra Varti ensured removal of residual drug, prevention of Kapha accumulation, and maintenance of channel patency. These steps stabilize local mucosa and prevent post-procedure complications.

5. Pratimarsha Nasya

Pratimarsha Nasya (2 bindu per nostril daily at night for 21 days) served as a Shamana and Brimhana continuation phase.

Probable Mechanism of Pratimarsha Nasya

- ✓ Provides sustained lubrication and nourishment of nasal mucosa and neural pathways
- ✓ Maintains Vata–Kapha balance in Urdhwajatrugata region
- ✓ Supports neuroendocrine stability through gentle, repeated stimulation
- ✓ Acts as Rasayana, aiding Dhatu Poshana and long-term metabolic regulation
- ✓ Night-time (Kapha Kala) administration enhances absorption and tissue nourishment

Unlike Marsha Nasya (eliminative), Pratimarsha works as a maintenance neurometabolic modulator**.**

6. Integrated Mode of Action in Hypothyroidism

The combined 28-day protocol (7 days Marsha + 21 days Pratimarsha) produces a

Shodhana–Shamana continuum

Table 9: Integrated mode of action of in Hypothyroidism.

Component	Functional Role
Deepana–Pachana	Corrects Agnimandya, digests Ama
Abhyanga–Swedana	Mobilizes Doshas, improves circulation
Marsha Nasya	Eliminates Kapha–Vata, clears channels, stimulates HPT axis
Pratimarsha Nasya	Maintains Dosha balance, nourishes tissues, stabilizes endocrine function

From a contemporary perspective, intranasal lipid-based delivery may facilitate direct nose-to-brain transport**,** influencing hypothalamic centers involved in endocrine control. This neuroendocrine modulation, along with improved systemic metabolism via Deepana–Pachana drugs (Pippali, Shunthi, Chitraka) and Rasayana support (Guduchi, Bala), may explain the significant reduction in serum TSH observed.

2. Drug Effect

Mechanism of Action of Thumbi Taila (Olfacto-Neuroendocrine & Metabolic Modulation via Nasya)

Following intranasal administration, the lipid-based Thumbi Taila lodges over the olfactory and respiratory epithelium**,** enabling rapid absorption through olfactory, trigeminal, and vascular pathways. Its lipophilic nature facilitates transcellular diffusion and perineural transport, allowing phytoconstituents to reach the olfactory bulb, hypothalamus, and pituitary, thereby influencing the Hypothalamo–Pituitary–Thyroid (HPT) axis.

Key pharmacological contributions include

- Embelin (Vidanga): Lipolytic, antioxidant, and antimicrobial actions reduce Medo Dushti and improve cellular metabolism.
- Plumbagin (Chitraka): Enhances mitochondrial respiration and neuronal activity, supporting Agnideepana and hypothalamic TRH neuron stimulation.
- Piperine & Piperlongumine (Pippali, Maricha): Neurotransmitter enhancers and bioavailability promoters that improve transnasal drug delivery.
- Zingiberol (Shunthi): Improves cerebral circulation and synaptic efficiency.
- Berberine (Daru Haridra): Dopaminergic modulation and antioxidant neuroprotection.
- Triterpenoids & β-carotene (Katutumbi): Antioxidant and hepatometabolic support, aiding peripheral T4→T3 conversion.
- Sinigrin (Sarshapa): Thermogenic and lipid-metabolic stimulation.
- Rasna & alkaline salts (Saindhava, Yavakshara): Anti-inflammatory, Srotoshodhana, and enhanced tissue penetration.

Collectively, these actions stimulate hypothalamic TRH secretion, promote pituitary TSH regulation, enhance thyroid hormone synthesis, improve thermogenesis, and correct Agnimandya and Kapha–Vata predominance.

Mechanism of Action of Amritadya Taila (Neuroendocrine Modulation via Nasya)

Amritadya Taila similarly reaches central neuroendocrine centers via olfactory and trigeminal pathways, modulating hypothalamic and pituitary function.

Major components act as follows

- Berberine (Guduchi): Modulates dopaminergic signaling and promotes TRH synthesis.
- Nimbin (Nimba): Anti-inflammatory and antioxidant neuronal protection.
- Flavonoids (Hamsapadi): Neuroprotective and hepatometabolic support.
- Conessine (Kutaja): CNS stimulant and anti-inflammatory action.
- Piperine (Pippali): Enhances bioavailability and brain delivery.
- Ephedrine-like alkaloids (Bala/Atibala): Sympathoadrenal stimulation and thermogenic activation.
- Cedrol (Devadaru): Autonomic regulation and improved cerebral perfusion.

These synergistically activate hypothalamic TRH neurons, regulate pituitary TSH secretion, and enhance thyroid hormone output, thereby restoring HPT-axis balance, metabolic activity, and reducing Kapha-Vata dominance.

Local Reflexogenic & Srotoshodhana Effects

Nasya also produces local neurovascular reflexes, increasing cerebral circulation, clearing Kapha-induced Srotorodha**,** reducing mucosal inflammation, and improving nasal absorptive capacity.

Therapeutic response correlates with Samyak Lakshana (clear passages, improved cognition, lightness), while Madhyama and Heena Lakshanas indicate partial or inadequate mucosal absorption.

Paschat Karma Role

Post-procedure measures ensure drug clearance, stabilization of neuroendocrine responses, prevention of Kapha re-accumulation, and maintenance of therapeutic benefit.

Possible Mechanisms of Nasya in Metabolic Regulation

Nasya Karma may influence metabolic regulation through integrated systemic, neuroendocrine, and peripheral mechanisms. During the preparatory phase, Deepana–Pachana improves Agni, gut function, and micronutrient absorption while reducing systemic inflammatory burden and Ama, thereby enhancing hypothalamic sensitivity. Abhyanga and Swedana increase regional microcirculation in the head–neck region, promote Srotoshodhana, and improve tissue perfusion, creating favorable conditions for neurohormonal signaling.

Following intranasal administration, lipid-soluble constituents of Nasya Dravya are absorbed through olfactory, trigeminal, and vascular pathways, reaching the hypothalamus and pituitary gland. These agents may stimulate thyrotropin-releasing hormone (TRH) neurons or modulate neurotransmitters such as dopamine, GABA, and noradrenaline, thereby activating the hypothalamic–pituitary–thyroid (HPT) axis. Enhanced TRH release promotes pituitary secretion of TSH, which stimulates thyroid hormone (T3, T4) synthesis, provided glandular function is intact.

Increased thyroid hormone availability improves basal metabolic rate, mitochondrial activity, thermogenesis, and lipid–carbohydrate metabolism, leading to enhanced cellular energy

production and metabolic efficiency. These effects support tissue repair, detoxification, and neurological function. As hormone levels normalize, negative feedback mechanisms regulate TRH and TSH secretion, maintaining endocrine homeostasis. Daily Pratimarsha Nasya provides mild, sustained neuroendocrine modulation, preventing abrupt hormonal fluctuations and supporting long-term HPT axis stability.

Additionally, Nasya oils possess anti-inflammatory, antioxidant, and neuroprotective properties, which may reduce oxidative stress in hypothalamic and pituitary neurons. Improved cerebral perfusion and parasympathetic predominance further enhance neuroendocrine regulation, sleep quality, and cortisol balance, contributing to systemic metabolic restoration.

Nasya Effect Timeline in Hypothyroidism

Before treatment, patients often exhibit metabolic sluggishness, poor micronutrient absorption, and chronic inflammation, which impair HPT responsiveness. During the first 7 days (Marsha Nasya), central stimulation and improved regional circulation may initiate neuroendocrine activation. Over the subsequent 21 days (Pratimarsha Nasya), sustained mild stimulation supports progressive thyroid responsiveness and metabolic improvement. By around one month, normalization trends in T3/T4 and TSH regulation may emerge through feedback mechanisms, accompanied by reduced fatigue, cold intolerance, and cognitive dullness. Continued follow-up suggests stabilization of HPT axis activity, improved symptom control, and potential reduction in inflammatory or metabolic stressors.

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CONCLUSION

This comparative clinical study assessed the efficacy of Thumbi Taila and Amritadya Taila administered as Marsha Nasya followed by Pratimarsha Nasya in hypothyroidism. The condition can be interpreted as a multisystem metabolic disorder with Kapha–Vata predominance, Agnimandya**,** and Rasadhatu dushti**.**

Both groups showed significant clinical improvement. Serum Free T4 levels exhibited minimal, non-significant changes**,** indicating that the therapy mainly exerted a regulatory influence rather than directly increasing hormone output. Serum TSH levels reduced significantly in both groups**,** with a greater reduction in Group A (Thumbi Taila) and a significant intergroup difference ($p = 0.0215$), suggesting better modulation of thyroid axis activity.

Clinical evaluation using symptom scores and Zulewski's clinical index revealed highly significant improvement in both groups, with Group A demonstrating superior reduction in post-treatment scores ($p = 0.0010$) and greater change from baseline ($p = 0.0027$). Symptoms such as fatigue, cold intolerance, weight gain, constipation, and metabolic sluggishness improved notably.

Overall, Thumbi Taila Nasya followed by Pratimarsha Nasya showed comparatively better efficacy than Amritadya Taila in improving clinical features and regulating thyroid function. Follow-up findings suggest that longer duration therapy may provide sustained and enhanced benefits.

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