

THE IMPACT OF STRESS ON THYROID FUNCTION: A CASE REPORT OF HYPOTHYROIDISM

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ABSTRACT

Background: Hypothyroidism is one of the most common endocrine disorders and is primarily diagnosed through laboratory investigations. Patients often present with nonspecific symptoms; anxiety and stress-related complaints are among the frequent manifestations. Accurate grading of anxiety together with management of the underlying thyroid dysfunction is essential to reduce morbidity and improve quality of life. **Method:** A 34-year-old woman presented with anxiety and related symptoms of one year's duration. Thyroid screening revealed subclinical hypothyroidism. Stress severity was assessed using the DASS-21 Stress Subscale. She was managed on an outpatient basis with the Ayurvedic formulations *Hansapadadi Kashayam*, *Laghu Sootshekhar Rasa*, *Brahmi Pearls*, *Gandamala Kandan Rasa*, *Kalingakadi Yoga*, *Kanchanar Guggulu*, and *Dashmoolarishta*. **Result:** Marked clinical improvement was observed. Thyroid function

tests, returned and remained within the normal range, Menstrual cycle returned to normal and DASS-21 Stress Subscale scores showed substantial reduction. **Conclusion:** Special attention to the evaluation and management of stress, together with thyroid screening, is warranted when patients present with nonspecific stress-related symptoms. Ayurvedic

management produced favourable effects on both DASS-21 Stress Subscale scores and thyroid hormone levels.

KEYWORDS: Stress, *Kanchanar Guggulu*, *Brahmi Pearls*, *Laghu Sootshekhar Rasa*, *Kalingakadi Yoga*, subclinical hypothyroidism.

INTRODUCTION

Thyroid disorders rank among the commonest endocrine diseases worldwide. Early diagnosis and treatment remain the cornerstone of management. Thyroid diseases are, arguably, among the commonest endocrine disorders worldwide. Early diagnosis and treatment remain the cornerstone of management. Thyroid diseases are different from other diseases in terms of their ease of diagnosis, accessibility of medical treatment, and the relative visibility that even a small swelling of the thyroid offers to the treating physician.^[1] Among adult people in India, the prevalence of hypothyroidism has been recently studied. In this population-based study done in Cochin on 971 adult subjects, the prevalence of hypothyroidism was 3.9%. The prevalence of subclinical hypothyroidism was also high in this study, the value being 9.4%. In women, the prevalence was higher, at 11.4%, when compared with men, in whom the prevalence was 6.2%. The prevalence of subclinical hypothyroidism increased with age. About 53% of subjects with subclinical hypothyroidism were positive for anti-TPO antibodies.^[2]

Hypothyroidism may result from primary gland failure or from insufficient stimulation by the hypothalamic–pituitary axis. It is commonly associated with lipid abnormalities and exerts widespread metabolic effects because virtually every tissue requires thyroid hormone. Untreated disease can contribute to hypertension, dyslipidemia, infertility, cognitive impairment and neuromuscular dysfunction. Serum thyroid-stimulating hormone (TSH) remains the most sensitive laboratory indicator of thyroid status. Chronic stress and anxiety can further influence thyroid function through hypothalamic–pituitary–adrenal axis interactions. A multifactorial approach encompassing diet, medication and lifestyle measures is therefore required for successful management.

PATIENT INFORMATION

Female patient 34-year-old encountering side effects of Insomnia, dry skin, going bald, Hyper pigmentation, Hyperacidity, Palpitations, Hyperacidity and Irregular menses for the beyond Five years. She has been taking Tab Carbimazole 10mg one tablet at night and has a

clinical history of hypothyroidism going back a similar measure of time. She has no significant family clinical history, nor does she have a background marked by diabetes, pneumonic tuberculosis, bronchial asthma, epilepsy, hypertension, or some other serious clinical issues. Besides, her earlier clinical records contain no data in regards to any surgeries. In the assessment of the patient, their general condition was surveyed as fair, without any indications of fever noted. Their heartbeat rate was recorded at 74 beats per minute, and her blood pressure was 116/86 mmHg. Respiratory examination revealed clear bilateral air entry. All routine clinical examinations were within normal limits.

MATERIALS AND METHODS

Study Design

This study was conducted as a single-patient observational case report following the CARE (Case Report) guidelines. The patient diagnosed with hypothyroidism was managed using an integrative approach consisting of Ayurvedic medicines along with conventional thyroid hormone replacement therapy. The treatment protocol, dosage, duration, follow-up, and clinical outcomes were documented systematically.

Procurement of Ayurvedic Medicines

The prescribed Ayurvedic medicines, including *Hansapadadi Kashayam*, *Laghu Sootshekhar Rasa*, *Brahmi Pearls*, *Gandamala Kandan Rasa*, *Kalingakadi Yoga*, *Kanchanar Guggulu*, and *Dashmoolarishta*, were procured from GMP-certified Ayurvedic pharmaceutical companies through authorized pharmacies. The medicines were administered in their commercially available forms as per the recommended dosage and duration. No modification or in-house preparation of the formulations was carried out.

Therapeutic Intervention

The patient received individualized Ayurvedic treatment based on the principles of *Dosha*, *Dushya*, *Agni*, and *Srotas* assessment. The treatment protocol was modified during follow-up according to the patient's clinical response while conventional therapy (Carbimazole) was continued and tapered under physician supervision. The treatment also included dietary advice, lifestyle modifications, Yoga, Pranayama, and Mudra practice.

Treatment Protocol

At the time of presentation, the patient was receiving Tab. Carbimazole 10 mg/day for hypothyroidism. After initiation of Ayurvedic treatment, thyroid hormone replacement was

gradually tapered under medical supervision based on clinical improvement and thyroid function test (TFT) results.

First Follow-up (After 1 Month): The patient reported marked improvement in the following symptoms.

- Palpitations reduced
- Improvement in Sleep
- Hyperacidity reduced
- Appetite improved
- Constipation relieved
- Hair fall reduced
- Skin complexion improved
- Body weight reduced by approximately 1 kg

The Ayurvedic treatment was continued without modification. The dose of Tab. Carbimazole was reduced to 5mg/day under medical supervision.

Second Follow-up (After 3 Months) During the second follow-up.

- The patient continued to feel symptomatically better.
- Regular menses, mild lower abdominal pain during periods
- Body weight reduced by an additional 2 kg.
- Mild swelling all over body after menses

The Ayurvedic medications were continued, and Tab. Carbimazole reduced to 5 mg on alternate days under physician supervision

Third Follow-up (After 3 Months) During the Third follow-up.

- Thyroid Function Test (TFT) values were within normal limits.
- Menses are totally normal now
- Swelling is totally gone from face and body
- All symptoms are normal

The Ayurvedic medications were continued, and Tab. Carbimazole discontinued under physician supervision.

Ayurvedic Clinical Assessment

Dashvidhpariksha

- *Prakriti*–*vatapittaj*,
- *Vikriti*–*prakritisamsamveta*,
- *Sara* – *Mamsa sara*,
- *Samhanana*- *madhyam*,
- *Praman*- *madhyam*,
- *Satmya*-*madhyam*,
- *Satwa*-*Madhyam*,
- *Ahar*- *madhyam*,
- *Vyayam*- *madhyam*,
- *Vaya*- *yuva*,

Ashtavidha Pariksha (Eightfold Examination)

- *Nadi* (Pulse)- 74 beats/minute; regular; *Pitta*- *Vata* predominant
- *Mutra* (Urine)-Normal frequency (7–8 times/day); *Samyaka*
- *Mala* (Stool)- Incomplete evacuation with constipation
- *Jivha* (Tongue)- Whitish coating (*Sama Jivha*), suggestive of *Ama*
- *Shabda* (Speech)- Normal
- *Sparsha* (Touch)- Dry (*Ruksha*), warm (*Ushna*) skin and Hyperpigmentation (*Vaivarnya*)
- *Druk* (Eyes)- Normal examination
- *Aakriti* (Body Build)- *Madhyama* (Mesomorphic)

During subsequent follow-up visits, pulse examination demonstrated gradual normalization of the *Pitta-Vata* predominance, indicating restoration of *Dosha* equilibrium following treatment.

***Nidana Panchaka* (Ayurvedic Diagnostic Assessment):** The patient's condition was evaluated using the principles of *Nidana Panchaka*, which provides a comprehensive understanding of disease causation and pathogenesis in Ayurveda.

Nidana (Etiological Factors)

- Stress (*Chinta*)
- Insomnia (*Anidra*)

- Improper dietary habits (*Ahitakara Ahara*)
- Sedentary lifestyle
- *Agnimandya* (Impaired digestive fire)
- *Pitta* and *Vata* provoking diet and lifestyle practices

These factors contributed to the vitiation of *Pitta* and *Vata Dosha*.

Purvarupa (Prodromal Features): The patient experienced several early manifestations suggestive of thyroid dysfunction, including.

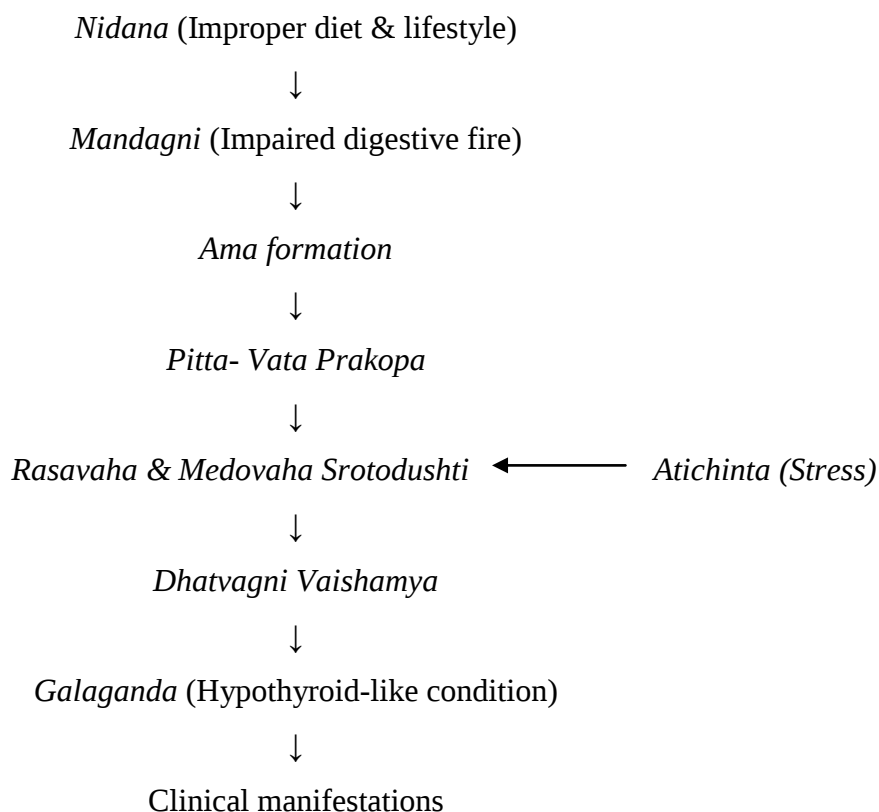
- Lethargy
- Weight gain
- Dry skin
- Generalized weakness

Rupa (Clinical Features): The fully developed clinical features included:

- Constipation
- Hair fall
- Fatigue
- Hyperpigmentation
- Palpitations
- Weight changes
- Insomnia
- Reduced appetite

Upashaya and Anupashaya: The patient's symptoms improved following administration of Ayurvedic medicines, dietary modifications, and lifestyle interventions, indicating a positive *Upashaya*. Aggravation of symptoms was observed with unhealthy dietary habits and irregular lifestyle (*Anupashaya*).

Samprapti (Pathogenesis): According to Ayurvedic principles, improper diet and lifestyle resulted in *Mandagni*, leading to the formation of *Ama*. The accumulated *Ama* vitiated *Tri Dosha*, causing dysfunction of *Rasavaha* and *Medovaha Srotas*. This disturbed tissue metabolism (*Dhatvagni*) and manifested clinically as hypothyroid symptoms resembling *Galaganda*. The therapeutic regimen aimed to restore *Agni*, digest *Ama*, pacify *Pitta* and *Vata*, clear the obstructed *Srotas*, and re-establish normal physiological functions. Shown in Flow Diagram No. 1



(Constipation, fatigue, dry skin, hair fall, weight changes, palpitations, irregular menses)

Flow Diagram No 1: *Samprapti* of Hypothyroidism

CLINICAL FINDINGS

At the initial presentation, the patient reported irregular menstruation, constipation, disturbed sleep, hyperacidity, fatigue, poor complexion, and generalized weakness. During follow-up, she also experienced generalized swelling after menstruation. General physical examination was otherwise unremarkable, and no thyroid swelling or neck enlargement was observed. Respiratory, cardiovascular, abdominal, and neurological examinations were within normal limits. The patient's thyroid dysfunction was primarily reflected by her clinical symptoms and thyroid function test abnormalities rather than by any palpable enlargement of the thyroid gland.

Cardiovascular assessment identified bradycardia with intermittent palpitations. Dermatological examination showed dry skin and increased hair fall, corresponding to the patient's reported symptoms. The patient also complained of generalized weakness, easy fatigability, and reduced physical stamina. General examination revealed weight gain, facial puffiness, and mild periorbital edema, suggesting altered metabolic function. Respiratory and other systemic examinations were unremarkable.

Taken together, these clinical findings indicated multisystem involvement commonly associated with thyroid dysfunction. Considering the patient's symptom profile and Ayurvedic assessment, an integrative treatment plan comprising *Hansapadadi Kashayam*, *Laghu Sootshekhar Rasa*, *Brahmi Pearls*, *Gandamala Kandan Rasa*, *Kalingakadi Yoga*, *Kanchanar Guggulu*, and *Dashmoolarishta* along with appropriate dietary and lifestyle modifications, was initiated to restore *Dosha* balance and improve overall health.

The symptoms described in the case were graded using predefined scoring systems for hair fall, dryness (*Rookshata*), constipation, and facial hyperpigmentation to assess disease severity and monitor therapeutic response during follow-up as shown in Table No 1.

Hair Fall Grading System^[3]

- Grade 0 (Normal -): Hair fall is minimal with 1 to 5 hairs falling during combing or washing.
- Grade 1 (Mild +): Hair fall is less than 20 hairs when combing or washing.
- Grade 2 (Moderate ++): Hair fall is more pronounced, with more than 20 hairs falling during combing or washing.
- Grade 3 (Severe +++): Hair fall occurs even with minimal hand strength (less than 20 hairs fall simply when applying a gentle hand force).

Dryness (*Rookshata*) Grading System^[3]

- Grade 0 (No Dryness-): The skin appears normal, without any signs of dryness.
- Grade 1 (Mild +): The skin is dry, accompanied by rough texture but no flaking or other significant changes.
- Grade 2 (Moderate ++): There is visible scaling on the dry skin, indicating a more pronounced level of dryness.
- Grade 3 (Severe +++): The dryness is extreme, and the skin is cracking, which indicates significant skin barrier damage.

Constipation Scoring System^[4]

- Score 0 (No Constipation -): Normal bowel movement frequency- 1 to 2 times per day or once every two days.
- Score 1 (Mild +): Bowel movements occur only two times per week, indicating mild constipation.

- Score 2 (Moderate ++): Bowel movements occur once per week, which is a sign of moderate constipation

Grading of Facial Hyperpigmentation^[5]

- Grade 0: No visible hyperpigmentation
- Grade 1(Mild +): A small area of the face with slight discoloration
- Grade 2(Moderate ++): Larger area with clearly visible discoloration
- Grade 3(Severe +++): Extensive facial areas with marked dark pigmentation

Stress Assessment (DASS-21 Stress Subscale)^[6]

Stress was assessed using the Stress subscale of the Depression Anxiety Stress Scale-21 (DASS-21). The severity of stress was graded as follows.

- 0–14: Normal (-)
- 15–18: Mild stress (+)
- 19–25: Moderate stress (++)
- 26–33: Severe stress (+++)
- ≥ 34 : Extremely severe stress (++++)

Frequency Scale for the Symptoms of GERD (FSSG) Grading System^[7]

Scoring Pattern: 0 – Never, 1 – Occasionally, 2 – Sometimes, 3 – Often, 4 – Always

- Score 0–7 (- No significant reflux symptoms): Minimal or absent GERD-related symptoms.
- Score ≥ 8 (+- Presence of GERD symptoms): Suggestive of gastroesophageal reflux disease/hyperacidity-related symptoms.
- Higher scores (++) indicate increased frequency and severity of reflux symptoms.

OBSERVATIONS AND RESULTS

Table No. 1: Observations and Results on each follow up.

Date	Day	Symptoms	Laboratory Investigation	Treatment
19/01/2025	Day 1	Hair fall +++ Dryness + Constipation + Facial pigmentation ++ Stress +++ Hyperacidity ++	Thyroid profile T3-2.02 nmol/L T4-117.69 nmol/L TSH- 1.08 μ IU/mL	<i>Hansapadadi Kashayam, Laghu Sootshekhar Rasa, Brahmi Pearls, Gandamala Kandan Rasa</i>
19/02/2025	Follow up	Hair fall ++		<i>Laghu Sootshekhar</i>

	1 month	Dryness + Constipation Facial pigmentation + Stress + Hyperacidity +		<i>Rasa, Brahmi Pearls, Kalingakadi Yoga, Kanchanar Guggulu, Dashmoolarishta,</i>
25/05/2025	Follow up 3 months	Hair fall + Dryness Constipation Facial pigmentation Stress Hyperacidity	Thyroid profile T3- 2.01 nmol/L T4- 116.80 nmol/L TSH- 0.98 μIU/mL	<i>Laghu Sootshekhar Rasa, Kalingakadi Yoga, Kanchanar Guggulu</i>
27/08/2025	Follow up 3 months	Hair fall Dryness Constipation Facial pigmentation Stress Hyperacidity (all symptoms were reduced)	Thyroid profile T3-1.98 nmol/L T4-100.20 nmol/L TSH-0.25 μIU/mL	<i>Kalingakadi Yoga, Kanchanar Guggulu</i>

DISCUSSION

Hypothyroidism is a common endocrine disorder characterized by insufficient production or action of thyroid hormones, leading to multisystem manifestations involving metabolism, cardiovascular function, skin, gastrointestinal tract, and reproductive health. Although thyroid hormone replacement remains the standard treatment approach, patients may continue to experience nonspecific symptoms such as fatigue, sleep disturbance, anxiety, constipation, dry skin, and hair fall. Stress and psychological disturbances may further influence thyroid function through complex interactions involving the hypothalamic–pituitary–adrenal (HPA) axis, inflammatory mediators, and neuroendocrine regulation.^[8]

In Ayurveda, hypothyroidism is clinically correlated with *Galaganda*, a disorder involving abnormal functioning of thyroid tissue, although direct equivalence is not mentioned in classical texts. The pathogenesis can be understood through *Agnimandya*, *Ama* formation, *Dosha* imbalance, and *Medovaha-Rasavaha Srotodushti*. The present case demonstrated features such as constipation, dry skin, hair fall, weight changes, fatigue, and menstrual irregularity, which indicate impairment of Agni and disturbed metabolic transformation. The patient's Nidana assessment revealed chronic stress (*Chinta*), insomnia (*Anidra*), improper dietary habits, and sedentary lifestyle, which contributed to *Dosha* imbalance and progression of disease pathology.

The therapeutic approach in this case was based on the Ayurvedic principles of *Nidana Parivarjana*, *Agni Deepana*, *Ama Pachana*, *Srotoshodhana*, and *Dosha Samshamana*. The selected formulations *Hansapadadi Kashayam*, *Laghu Sootshekhar Rasa*, *Brahmi Pearls*, *Gandamala Kandan Rasa*, *Kalingakadi Yoga*, *Kanchanar Guggulu*, and *Dashmoolarishta* were prescribed considering the patient's *Dosha* predominance, symptom profile, and involvement of *Rasavaha* and *Medovaha Srotas*.

Kanchanar Guggulu is traditionally indicated in glandular disorders, including *Granthi* and *Galaganda*, due to its *Kapha-Medohara* and *Lekhana* properties. The ingredients such as *Kanchanara* (*Bauhinia variegata*), *Guggulu* (*Commiphora mukul*), *Triphala*, *Trikatu*, and *Varuna* (*Crataeva nurvala*) possess *Deepana*, *Pachana*, and *Srotoshodhana* actions, which help in reducing *Kapha* accumulation and correcting metabolic dysfunction. *Guggulu* has also demonstrated anti-inflammatory and lipid-modulating activities, supporting its role in disorders associated with altered metabolism.^[9]

Hansapadadi Kashayam was selected for its balancing effect on *Vata-Kapha Dosha* and its ability to improve *Agni* and digestion. The formulation supports correction of metabolic disturbances by enhancing digestive capacity and reducing *Ama* accumulation. Improvement in constipation, appetite, and general metabolic symptoms observed in this patient may be attributed to its *Deepana-Pachana* and *Anulomana* actions.

Laghu Sootshekhar Rasa contains ingredients with *Pitta shamaka* and *Agni-regulating* properties. The formulation is traditionally used in disorders associated with hyperacidity, nausea, burning sensation, and digestive disturbances. In the present case, improvement in hyperacidity symptoms may be related to its ability to regulate aggravated *Pitta* and normalize gastrointestinal function.

Brahmi Pearls were incorporated considering the patient's prominent stress, anxiety, and sleep disturbance. *Brahmi* (*Bacopa monnieri*) is classified as a *Medhya Rasayana* and has been reported to possess anxiolytic, neuroprotective, and adaptogenic properties. Clinical studies have demonstrated its beneficial effects on stress perception, cognitive function, and anxiety-related symptoms through modulation of neurotransmitter activity and oxidative stress pathways.^[10] The marked reduction in DASS-21 stress scores observed in this patient may be associated with the psychological benefits of *Brahmi* along with Yoga, Pranayama, and lifestyle modification.

Gandamala Kandan Rasa was selected due to its classical indication in cervical glandular disorders and inflammatory conditions. Its ingredients possess *Vata balancing*, *Shothahara*, and *Srotoshodhaka* properties, which may support correction of glandular dysfunction and improve tissue metabolism.

Kalingakadi Yoga is traditionally described for improving *Agni* and correcting metabolic disturbances associated with *Kapha* predominance. The formulation supports digestion, reduces *Ama*, and improves physiological functioning of tissues. Its inclusion in later follow-up phases was based on continued improvement and the requirement for maintaining metabolic balance.

Dashmoolarishta was administered considering its *Vata*-pacifying and anti-inflammatory actions. *Dashamoola* formulations are traditionally used for *Vata* disorders, weakness, and inflammatory conditions. The improvement in generalized weakness, body discomfort, and overall energy levels may be associated with restoration of *Vata* equilibrium.^[11]

Stress assessment using the DASS-21 Stress Subscale showed a reduction from severe stress to normal levels during follow-up. Chronic psychological stress is known to influence thyroid physiology by altering cortisol secretion, immune function, and thyroid hormone metabolism. Stress reduction through Ayurvedic interventions, including *Brahmi* administration, Yoga, Pranayama, and lifestyle regulation, may have contributed to improved neuroendocrine balance.^[12]

The patient also showed improvement in hyperacidity symptoms assessed using the Frequency Scale for the Symptoms of GERD (FSSG). The reduction in FSSG score may be explained by the *Pitta*-balancing and *Agni*-regulating properties of *Laghu Sootshekhar Rasa* and dietary modifications. The FSSG is a validated instrument for evaluating reflux-related symptoms, with higher scores indicating increased frequency and severity of gastroesophageal reflux manifestations.^[13]

The improvement in dermatological symptoms such as dryness, hair fall, and facial hyperpigmentation may be correlated with correction of metabolic imbalance and improved tissue nourishment. Thyroid hormones influence epidermal turnover, hair follicle cycling, and pigmentation pathways; therefore, restoration of thyroid function may gradually normalize these manifestations.^[14]

The patient's thyroid profile improved during the treatment period, with normalization of T3, T4, and TSH levels, along with gradual reduction and discontinuation of conventional medication under physician supervision. This improvement may be attributed to the synergistic action of multiple Ayurvedic formulations targeting *Agni*, *Dosha* equilibrium, *Srotas* function, and psychological stress. Similar integrative approaches have been reported to demonstrate beneficial outcomes in thyroid disorders by addressing both physiological and psychosomatic components of disease.^[15]

The present case highlights the importance of an individualized Ayurvedic approach in the management of hypothyroidism, considering not only biochemical abnormalities but also associated symptoms, psychological status, dietary patterns, and lifestyle factors. However, as this is a single-patient observational case report, further controlled clinical studies with larger sample sizes are required to establish the efficacy and safety of these interventions.

CONCLUSION

The present case highlights the potential role of an individualized Ayurvedic approach in the management of hypothyroidism. The combined use of Ayurvedic formulations with lifestyle modifications showed improvement in clinical symptoms, stress levels, and thyroid function parameters. Further clinical studies are required to establish the efficacy and safety of Ayurvedic interventions in thyroid disorders.

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