

Role of Agni and Ama in the Pathogenesis of Hypothyroidism: A Comprehensive Ayurvedic and Contemporary Review

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Abstract—Hypothyroidism is a common endocrine disorder characterized by inadequate thyroid hormone activity. Patients typically present with fatigue, weight gain, cold intolerance, constipation, dry skin, lethargy and cognitive changes. Primary hypothyroidism is diagnosed primarily through biochemical assessment of serum thyroid-stimulating hormone (TSH) and free thyroxine (FT4) (1).

Ayurveda does not describe hypothyroidism as a single disease entity. Its clinical manifestations can be examined through the fundamental principles of *Agni*, *Ama*, *Dosha*, *Dushya* and *Srotas*. *Agni* represents the principle of transformation and metabolism; impaired *Agni* results in improper processing and formation of *Ama* (2). The clinical features associated with *Mandagni* and *Ama*—including *Gaurava* (heaviness), *Alasya* (lethargy), *Aruchi* (anorexia) and *Mala Sanga* (constipation)—show conceptual overlap with manifestations observed in hypothyroidism (3).

To critically review the possible role of *Agni* and *Ama* in understanding the pathogenesis and clinical manifestations of hypothyroidism from an Ayurvedic perspective, and to explore their possible correlation with contemporary concepts of metabolism and thyroid physiology.

A narrative conceptual review was undertaken using classical Ayurvedic literature—*Charaka Samhita*, *Sushruta Samhita* and *Ashtanga Hridaya*—alongside contemporary literature on hypothyroidism, thyroid physiology and Ayurveda research. Classical concepts were critically interpreted and compared with contemporary biomedical concepts without assuming direct equivalence between the two frameworks.

The review suggests that *Mandagni*, *Ama*, *Kapha* predominance, *Meda Dushti* and *Srotodushti* may provide a coherent Ayurvedic framework for interpreting several clinical features of hypothyroidism. However, *Agni* cannot be considered synonymous with thyroid hormone activity, nor can *Ama* be equated with

a specific biochemical toxin. The proposed Ayurvedic model should therefore be considered a conceptual hypothesis requiring further clinical and experimental validation.

Agni and *Ama* may have an important conceptual role in the Ayurvedic interpretation of hypothyroidism. A framework involving *Nidana* → *Agni Dushti* → *Ama* formation → *Dosha-Dushya* interaction → *Srotodushti* → metabolic dysfunction may help organize the clinical understanding of the disorder. Further observational, prospective and interventional studies are required to determine the clinical validity of this proposed relationship.

Index Terms—*Agni*, *Ama*, *Mandagni*, Hypothyroidism, Thyroid, *Kapha*, *Meda*, *Srotodushti*, Ayurveda, Metabolism

I. INTRODUCTION

Hypothyroidism is a disorder characterized by inadequate thyroid hormone activity. Thyroid hormones exert extensive physiological effects on energy expenditure, thermogenesis, cardiovascular function, gastrointestinal motility and metabolism. Primary hypothyroidism is diagnosed by biochemical evidence of elevated TSH with reduced FT4 in overt disease (1).

Patients present with fatigue, weight gain, cold intolerance, constipation, dry skin, muscle weakness, lethargy and impaired memory. These symptoms are nonspecific and require biochemical confirmation (4). From an Ayurvedic perspective, hypothyroidism does not have a universally accepted one-to-one equivalent among the classical disease entities. Ayurveda evaluates disease through *Nidana* (etiological factors),

Dosha, Dushya, Agni, Ama, Srotas and Samprapti (pathogenesis) (2).

Among these, *Agni* is of fundamental importance. The *Charaka Samhita* describes *Agni* as the root of life, health and strength (5). The physiological state of *Agni* determines the proper transformation of consumed food and contributes to the nourishment of *Dhatus*. Disturbance of *Agni* results in impaired digestion and abnormal metabolic processing.

Mandagni, or diminished digestive and metabolic capacity, is particularly relevant to clinical conditions characterized by heaviness, impaired appetite, sluggish digestion and reduced physiological activity (6).

Ama is traditionally described in relation to impaired digestion and improper processing. The *Charaka Samhita* states that *Ama* is produced when *Agni* is weak (*Mandagni*) (7). Features associated with *Ama* include *Gaurava* (heaviness), *Aruchi* (anorexia), *Alasya* (lethargy) and impaired digestion (8).

Several clinical manifestations commonly encountered in hypothyroidism—weight gain, heaviness, lethargy, excessive sleep, constipation and reduced activity—can be interpreted through these Ayurvedic constructs. This raises an important question: Can *Agni Dushti* and *Ama* provide a meaningful Ayurvedic framework for understanding the clinical phenotype and pathogenesis of hypothyroidism? The present review attempts to examine this question critically.

II. AIM AND OBJECTIVES

Aim

To critically review the role of *Agni* and *Ama* in the Ayurvedic understanding of hypothyroidism and to explore their possible relationship with contemporary concepts of thyroid function and metabolism.

Objectives

1. To review the classical Ayurvedic concept of *Agni* and *Mandagni*
2. To examine the classical concept of *Ama* and its relationship with *Agni*
3. To analyze the possible involvement of *Dosha, Dushya* and *Srotas* in hypothyroidism
4. To develop a proposed Ayurvedic *Samprapti* of hypothyroidism

5. To explore possible conceptual correlations between *Agni-Ama* and contemporary metabolic physiology
6. To identify gaps in current evidence and suggest directions for future research

III. MATERIALS AND METHODS

The present article is a narrative conceptual review. Classical Ayurvedic literature including *Charaka Samhita* (5), *Sushruta Samhita* (9), *Ashtanga Hridaya* (10) and *Madhava Nidana* (11) was considered for the concepts of *Agni, Mandagni, Ama, Dosha, Dushya, Meda, Srotas* and *Samprapti*. Contemporary literature concerning hypothyroidism, thyroid physiology, TSH, FT4 and Ayurveda research was also reviewed.

Contemporary evidence confirms that TSH is the principal biochemical marker for assessing primary thyroid dysfunction, with FT4 providing confirmation of thyroid hormone status (1).

The present review distinguishes between classical Ayurvedic descriptions, contemporary biomedical evidence and conceptual correlations proposed by the authors. This distinction is important because Ayurvedic constructs such as *Agni* and *Ama* should not automatically be treated as direct biomedical equivalents.

IV. CONCEPT OF AGNI IN AYURVEDA

Agni is one of the fundamental concepts of Ayurvedic physiology. The *Charaka Samhita* describes *Agni* as the factor responsible for digestion, metabolism and transformation of food into *Dhatus* (5). In its broadest sense, *Agni* represents the principle responsible for digestion, transformation and assimilation (12).

Ayurveda describes *Agni* at different levels:

4.1 Jatharagni

Jatharagni is associated primarily with digestion and transformation of ingested food. The *Charaka Samhita* considers it the most important of all *Agni* types because it governs the function of other *Agnis* (5).

4.2 Bhutagni

Bhutagni participates in further transformation of the elemental components of food (10).

4.3 Dhatvagni

Dhatvagni is associated with the transformation and metabolism occurring at the level of individual *Dhatus*. The *Charaka Samhita* describes seven types of *Dhatvagni*, each corresponding to a *Dhatu* (5).

The concept of *Agni* extends beyond simple gastrointestinal digestion. This broader interpretation becomes important when discussing hypothyroidism, because thyroid hormones regulate multiple aspects of energy expenditure and metabolism (13). However, *Jatharagni*, *Dhatvagni* and thyroid hormone activity should not be considered identical physiological entities.

Ayurveda describes four functional states of *Agni*: *Samagni* (balanced), *Vishmagni* (irregular, *Vata*-associated), *Tikshnagni* (excessively strong, *Pitta*-associated) and *Mandagni* (sluggish, *Kapha*-associated) (5). Among these, *Mandagni* appears most relevant to the conceptual interpretation of hypothyroidism.

V. MANDAGNI AND HYPOTHYROIDISM

Hypothyroidism is associated with reduced energy expenditure and metabolic manifestations including tiredness, weight gain, cold intolerance, constipation and dry skin (1).

From an Ayurvedic perspective, clinical features suggesting *Mandagni* include reduced appetite (*Aruchi*), delayed digestion, heaviness after meals (*Gaurava*), indigestion (*Avipaka*), lethargy (*Alasya*), constipation (*Mala Sanga*) and reduced activity (6). The clinical phenotype of some hypothyroid patients can be conceptually viewed through the lens of *Mandagni*. However, the relationship should be expressed cautiously: hypothyroidism produces clinical manifestations that may resemble *Mandagni*, rather than *Mandagni* being a proven cause of hypothyroidism.

VI. CONCEPT OF AMA

Ama is an important pathological concept in Ayurveda. The *Charaka Samhita* defines *Ama* as undigested or improperly metabolized material produced when *Agni* is impaired (7). It is not appropriate to equate *Ama* with a single modern biochemical substance.

Classically described *Ama*-associated features include *Gaurava* (heaviness), *Aruchi* (anorexia), *Alasya*

(lethargy), *Agni Mandya* (diminished digestive fire), *Avipaka* (indigestion), *Mala Sanga* (constipation), *Jihva Lepa* (coated tongue), *Klama* (fatigue) and *Angamarda* (body ache) (7,8).

The central conceptual relationship is:

Agni impairment → improper transformation → *Ama* formation

Ama may subsequently interact with *Dosha* and *Dushya* and contribute to disease manifestation (7).

VII. AMA AND HYPOTHYROIDISM

Several common manifestations of hypothyroidism overlap with clinical features traditionally associated with *Ama*:

Hypothyroid manifestation	Ayurvedic clinical concept
Heaviness	<i>Gaurava</i> (8)
Fatigue	<i>Klama</i> / <i>Alasya</i> (8)
Reduced appetite	<i>Aruchi</i> (8)
Constipation	<i>Mala Sanga</i> (8)
Excessive sleep	<i>Nidradhikya</i>
Weight gain	<i>Meda Vriddhi</i>
Sluggishness	<i>Kapha</i> predominance (5)
Reduced metabolic activity	<i>Mandagni</i> / <i>Dhatvagni</i> <i>Dushti</i> (6)

This overlap provides a rationale for examining *Ama* as a possible clinical construct in hypothyroidism. Nevertheless, the similarity of symptoms does not establish identity between the two systems. Fatigue in hypothyroidism has multiple possible biological mechanisms and cannot automatically be interpreted as *Ama* (4).

VIII. RELATIONSHIP BETWEEN AGNI AND AMA

The relationship between *Agni* and *Ama* is central to the proposed model.

Normal state: Proper *Agni* → Proper digestion → Proper tissue nourishment → Health (5)

Pathological state: *Agni Dushti* → Improper digestion/transformation → *Ama* → *Dosha-Dushya* interaction → Disease (7)

In the context of hypothyroidism, the proposed conceptual sequence is:

Nidana → *Kapha*-provoking factors → *Agni Dushti* → *Mandagni* → Impaired digestion → *Ama* formation → *Ama-Dosha* interaction → *Srotodushti* → *Meda/Rasa* involvement → Clinical manifestations

This model requires clinical validation.

IX. DOSHA, DUSHYA AND SROTAS INVOLVEMENT

9.1 *Dosha* Involvement

Kapha is particularly relevant because many clinical features of hypothyroidism resemble *Kapha*-associated manifestations: *Gaurava* (heaviness), *Alasya* (lethargy), *Nidradhikya* (excessive sleep), *Meda Vriddhi* (weight gain), *Mandagni* and reduced activity (5). A *Kapha-Meda* predominance may be considered in a subset of patients.

Vata may also contribute, particularly in patients presenting with constipation, dryness, variable appetite, neuromuscular symptoms and fatigue (5). Therefore, hypothyroidism should not be considered uniformly *Kapha*-dominant.

Pitta may not appear to be the dominant *Dosha* in the typical hypothyroid phenotype, but individual patients may exhibit *Pitta*-related features depending upon constitution, disease stage and associated pathology. The final *Dosha* assessment should be individualized (5).

9.2 *Dushya* Involvement

Potentially relevant *Dushyas* include (5):

- *Rasa Dhatu*: Systemic manifestations involving energy and nourishment
- *Meda Dhatu*: Weight gain and altered adiposity frequently encountered in hypothyroidism (1)
- *Mamsa* and *Majja*: Muscle weakness, myalgia and neuromuscular symptoms

9.3 *Srotas* Involvement

The following *Srotas* may be considered conceptually (10):

- *Annavaha Srotas*: Appetite changes, indigestion, *Mandagni*
 - *Medovaha Srotas*: Weight gain, *Meda Vriddhi*, altered adiposity
 - *Rasavaha Srotas*: Generalized systemic manifestations
 - *Purishavaha Srotas*: Constipation and *Mala Sanga*
- This suggests that hypothyroidism may be interpreted as a multisystemic *Dosha-Dushya-Srotas* disorder.

X. POSSIBLE NIDANA AND PROPOSED SAMPRAPTI

10.1 Possible *Nidana*

The following factors may be considered in the Ayurvedic assessment (5,10):

Ahara-related factors: Excessive *Guru Ahara* (heavy food), excessive *Madhura Rasa* (sweet taste), excessive *Snigdha Ahara* (unctuous food), excessive intake, irregular dietary practices and *Adhyashana* (eating before previous meal is digested).

Vihara-related factors: Sedentary lifestyle, excessive daytime sleep, lack of physical activity, irregular sleep and inadequate exercise.

These factors may contribute to *Kapha* aggravation and impaired *Agni* in susceptible individuals. However, they should be considered possible Ayurvedic risk factors, not proven causes of biomedical hypothyroidism.

10.2 Proposed *Samprapti*

Nidana Sevana → *Kapha Vriddhi* → *Agni Dushti* → *Mandagni* → Impaired digestion → *Ama Utpatti* → *Ama-Dosha Sammurchana* → *Srotodushti* → *Rasa/Meda Dhatu Dushti* → *Kapha* predominance ± *Vata* involvement → Reduced metabolic function → Clinical manifestations of hypothyroidism

XI. CONTEMPORARY UNDERSTANDING OF HYPOTHYROIDISM

Modern endocrinology recognizes thyroid hormones as important regulators of metabolism (13). In primary hypothyroidism, impaired thyroid hormone production leads to increased hypothalamic-pituitary stimulation, resulting in elevated TSH. Overt primary hypothyroidism is characterized by elevated TSH with low FT4, whereas subclinical hypothyroidism

typically involves elevated TSH with FT4 within the reference range (1).

Common manifestations include fatigue, weight gain, cold intolerance, constipation, dry skin, muscle weakness, cognitive symptoms and reduced activity (1,4). Because these symptoms are nonspecific, laboratory confirmation is essential (4).

XII. AYURVEDIC AND CONTEMPORARY CORRELATION

Ayurvedic concept	Contemporary conceptual correlation
<i>Agni</i> (5)	Metabolic processes (13)
<i>Mandagni</i> (6)	Reduced metabolic activity (13)
<i>Ama</i> (7)	No established one-to-one equivalent
<i>Kapha</i> (5)	Phenotypic overlap with reduced activity/weight gain
<i>Meda Dushti</i> (5)	Increased adiposity (1)
<i>Srotodushti</i> (10)	No direct anatomical equivalent
<i>Dhatvagni Dushti</i> (6)	Altered tissue metabolism (13)

XIII. AGNI, AMA AND METABOLISM: A CRITICAL PERSPECTIVE

The strongest conceptual bridge between *Agni* and hypothyroidism is metabolism. Modern thyroid physiology demonstrates that thyroid hormones influence basal metabolic processes, thermogenesis and energy expenditure (13). Ayurveda describes *Agni* as the fundamental principle of transformation (5).

At a conceptual level, *Agni* → transformation and utilization, and thyroid hormones → regulation of metabolic activity, may appear analogous. However,

this similarity should not be interpreted as proof that thyroid hormone activity is simply a molecular manifestation of *Agni*. *Agni* is a broader Ayurvedic physiological construct that includes digestion and transformation at multiple levels (5). Thus, *Agni* may be viewed as a functional Ayurvedic model of transformation, while thyroid hormones represent specific biochemical regulators of metabolism.

Ama presents an even greater challenge for modern correlation. It is tempting to describe *Ama* as toxins, inflammatory mediators, metabolic waste, endotoxins or free radicals, but none of these can be considered a direct equivalent of classical *Ama* without specific evidence (7). A scientifically appropriate statement is that *Ama* is an Ayurvedic pathological construct associated with impaired digestion and abnormal processing, and its clinical manifestations may overlap with several metabolic and inflammatory states (7).

XIV. EXISTING RESEARCH ON AYURVEDA AND HYPOTHYROIDISM

Research investigating Ayurveda in hypothyroidism is emerging but remains heterogeneous. A randomized clinical trial evaluating *Pippali* in primary hypothyroidism explored its effects and discussed hypothyroid manifestations through Ayurvedic concepts including *Agni* and *Rasa*-related pathology (14). A more recent randomized controlled trial investigated a whole-system Ayurveda protocol as an adjunctive approach in patients with primary hypothyroidism receiving stable levothyroxine therapy, evaluating TSH, FT4, body weight, BMI and quality of life (15). A 2026 narrative review examining Ayurveda-based herbal medicines and yoga for hypothyroidism concluded that existing evidence is promising but remains heterogeneous, with limitations including small samples and lack of standardization (16). These studies support continued investigation but do not establish the *Agni-Ama* hypothesis as the confirmed pathogenesis of hypothyroidism.

XV. DISCUSSION

The review indicates that *Agni* and *Ama* can provide a useful framework for interpreting some clinical manifestations of hypothyroidism. Among the Ayurvedic concepts, *Mandagni* appears particularly relevant because patients with hypothyroidism may

exhibit reduced appetite, constipation, heaviness and lethargy (1,6). Similarly, *Ama* may be considered when multiple features such as *Gaurava*, *Aruchi*, *Alasya*, *Jihva Lepa* and *Mala Sanga* coexist with impaired digestion (7,8).

Kapha and *Meda* may explain the phenotype of weight gain, heaviness, lethargy and reduced activity, while *Vata* may contribute to constipation, dryness and neuromuscular manifestations (5). The important point is that the Ayurvedic interpretation should remain patient-specific. Not every patient with hypothyroidism will necessarily have *Mandagni*, *Ama*, *Kapha* predominance or *Meda Dushti*. Modern research also emphasizes that symptoms alone have limited diagnostic specificity and that biochemical testing remains necessary for diagnosis (4).

An integrated approach may be represented as: Modern diagnosis → biochemical confirmation (1), combined with Ayurvedic assessment → *Nidana* + *Dosha* + *Agni* + *Ama* + *Dushya* + *Srotas* (5,10). This approach allows Ayurveda to retain its own diagnostic framework without forcing direct equivalence with modern endocrinology.

XVI. FUTURE DIRECTIONS

1. Development of standardized *Agni* and *Ama* assessment tools correlated with TSH, FT4, BMI and resting energy expenditure
2. Observational studies to determine whether *Mandagni* → *Ama* → *Kapha/Meda* phenotype is more prevalent in hypothyroid patients
3. Prospective studies to investigate whether *Agni/Ama* abnormalities precede or follow changes in thyroid function
4. Interventional studies to investigate whether interventions aimed at improving *Agni* and reducing *Ama* influence symptoms, BMI, quality of life and thyroid function without compromising standard treatment

XVII. CONCLUSION

Hypothyroidism is a complex endocrine disorder that requires biochemical confirmation and appropriate medical management (1). Ayurveda does not provide a single classical disease entity that can be equated directly with hypothyroidism. Nevertheless, the concepts of *Agni*, *Ama*, *Dosha*, *Dushya*, *Meda* and

Srotas provide a potentially useful framework for understanding its clinical manifestations (5,7,10).

Among these, *Mandagni* and *Ama* may be particularly relevant in patients presenting with heaviness, lethargy, impaired appetite, constipation, excessive sleep and weight gain (6,7). *Kapha-Meda* involvement may contribute to the metabolic phenotype, while *Vata* may become relevant according to individual clinical presentation (5). The proposed model—*Nidana* → *Agni Dushti* → *Mandagni* → *Ama* → *Dosha-Dushya* interaction → *Srotodushti* → *Rasa/Meda* involvement → clinical manifestations—offers a coherent Ayurvedic hypothesis but should not be considered an established causal mechanism.

Importantly, *Agni* should not be equated with thyroid hormones and *Ama* should not be equated with a specific biochemical toxin. Future research should operationalize these concepts and test their associations with objective biochemical and metabolic parameters. Thus, the *Agni-Ama* perspective may provide a valuable foundation for developing a more individualized and research-oriented Ayurvedic understanding of hypothyroidism.

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