



Review Article

www.ijrap.net

(ISSN Online:2229-3566, ISSN Print:2277-4343)



PATHOPHYSIOLOGICAL ROLE OF DHATWAGNI DUSHTI IN CHRONIC METABOLIC DISORDERS: AN INTEGRATIVE REVIEW

Akanksha Chauhan *

Associate Professor, Department of Rog Nidan Evam Vikriti Vigyan, Uttaranchal Medical College of Ayurved and Research, Dehradun, Uttarakhand, India

Received on: 19/12/25 Accepted on: 12/2/26

***Corresponding author**

E-mail: akanksha.rocks1992@gmail.com

DOI: 10.7897/2277-4343.17268

ABSTRACT

Ayurveda emphasizes Agni (digestive and metabolic fire) as the fundamental determinant of health and disease. Among its various forms, Dhatwagni governs metabolism at the level of individual Dhatus (body tissues) and is responsible for their proper transformation and nourishment. Impairment of Dhatwagni, known as Dhatwagni Dushti, results in defective tissue metabolism, accumulation of metabolic by-products, and progressive Dhatu dysfunction. Chronic metabolic disorders such as obesity, type 2 diabetes mellitus, dyslipidemia, non-alcoholic fatty liver disease, and metabolic syndrome are characterized by deranged glucose and lipid metabolism, insulin resistance, mitochondrial dysfunction, and chronic low-grade inflammation. These pathological features show close conceptual parallels with Dhatwagni Dushti described in classical Ayurvedic literature. This review explores the concept of Dhatwagni and its pathological states as explained in Ayurvedic texts and correlates them with contemporary biomedical mechanisms involved in chronic metabolic disorders. Understanding this interface may provide a holistic and integrative framework for diagnosis, prevention, and management of metabolic diseases through Agni-centric Ayurvedic principles.

Keywords: Dhatwagni, Dhatwagni Dushti, metabolic disorders, Ayurveda, tissue metabolism

INTRODUCTION

Ayurveda, the ancient Indian system of medicine, emphasizes the concept of Agni (digestive and metabolic fire) as central to health and disease. The term Agni encompasses a multitude of physiological factors that govern and regulate the complex processes of digestion, metabolism, and tissue transformation. Among the three types of Agni — Jatharagni, Bhutagni, and Dhatwagni, Dhatwagni is specifically involved in the tissue level metabolism. Dhatwagni refers to the specific metabolic activity at the level of each Dhatu (bodily tissue)—Rasa, Rakta, Mamsa, Meda, Asthi, Majja, and Shukra¹. Its normal functioning is critical for tissue nutrition, transformation, and homeostasis². Any Dushti (impairment) disrupts the sequential nourishment of Dhatus and paves the way for a wide spectrum of disorders. Acharya Sushruta describes “Grahani” as an organ situated anatomically between the Amashaya (stomach) and Pakwashaya (large intestine), whose functional integrity is intrinsically dependent on the status of “Agni” (digestive/metabolic fire). Any derangement leads to dysfunction of Grahani, and conversely, impairment of Grahani affects the function of Agni³.

Metabolic disorders are a cluster of conditions characterized by deranged biochemical processes, including glucose and lipid metabolism. Chronic metabolic disorders such as obesity, type 2 diabetes mellitus, dyslipidemia, non-alcoholic fatty liver disease (NAFLD), and metabolic syndrome have become global health concerns. These conditions are characterized by imbalances in energy storage, nutrient metabolism, and chronic low-grade inflammation⁴. These manifestations can be attributed to Dhatu Dushti, often rooted in Agni Mandya (hypofunctioning of Agni) at both the Jatharagni and Dhatwagni levels.

This review aims to explore the diagnostic relevance of Dhatwagni Dushti in the pathogenesis of chronic metabolic disorders. By correlating classical Ayurvedic diagnostic tools with modern clinical and biochemical parameters, this work seeks to establish Dhatwagni (tissue-specific metabolic) dysfunction as a central pathological event in the progression of metabolic disease. Understanding this interface can not only enrich Ayurvedic diagnostics but also contribute to the development of integrative models of metabolic assessment and management.

Type of Study

This is a descriptive, analytical literary research study designed to explore the interrelationship between classical Ayurvedic concepts and contemporary biomedical parameters. It is a literary correlation-based diagnostic exploration.

Source of Data

Classical Ayurvedic texts such as Charaka Samhitā, Suśruta Samhitā, Aṣṭāṅga Hṛdaya, and relevant commentaries were reviewed to extract references. Additionally, modern medical textbooks like Harrison's Principles of Internal Medicine, Robbins and Cotran Pathologic Basis of Disease, and Davidson's Principles and Practice of Medicine were consulted for the contemporary understanding of metabolic and inflammatory disorders.

Concept and Importance of Agni

Acharya Charaka begins by emphasizing the central role of Agni—the biological fire or transformative principle in the body⁵

Agni is the root of life: Agni (digestive and metabolic fire) is considered the central factor responsible for digestion, absorption, assimilation, and transformation of food into the body's tissues. It supports life itself.

Health and disease depend on Agni: The balance or imbalance of Agni is directly linked to health and disease. When Agni functions properly, the individual remains healthy. When Agni is impaired (Mandagni, Tikshnagni, Vishamagni), it leads to the formation of Ama (toxic metabolic by-products) and diseases like Grahani, Atisara, etc.

Agni governs metabolism: Agni regulates the transformation of food at multiple levels—from Jatharagni (digestive fire in the stomach), to Bhutagni (metabolism of elemental components), and Dhatwagni (tissue-level metabolism).

Seat of Agni – Grahani: The Grahani (duodenum/small intestine) is identified as the seat of Agni, as it holds the ingested food until digestion is completed. If Agni is impaired, Grahani becomes dysfunctional, leading to malabsorption and systemic disorders.

Agni as the foundation of Ojas, Tejas, and Bala: A balanced Agni leads to the proper formation of Ojas (immunity and vitality), Tejas (cellular intelligence/metabolism), and Bala (strength).

Agni as the key to Ayurvedic diagnosis and treatment: Restoration and maintenance of Agni is the core principle in Ayurvedic treatment. The chapter emphasizes that no treatment can be successful without correcting Agni first.

All bodily processes like growth, decay, disease, constitution, activity, life, and death are dependent on Agni. From an anatomical and physiological perspective, Agni can be broadly classified into two main categories: Kayagni (digestive/metabolic fire at the systemic level) and Dhatwagni (metabolic fire specific to individual tissue levels).

Kayagni primarily governs the biochemical processes involved in gastrointestinal digestion. It is chiefly responsible for the breakdown of food within the Amashaya and Pachyamana Ashaya, which correspond to the stomach and intestines, respectively. Functionally, Kayagni is closely associated with the humoral mechanisms located in the duodenal mucosa that stimulate the secretion of essential digestive juices—namely gastric, pancreatic, and hepatic secretions—which are crucial for effective intestinal digestion.⁶

The Astanga Samgraha outlines a fundamental connection between Pachakagni (the digestive fire) and the individual Dhatwagnis (tissue-specific metabolic fires), suggesting that the functional state of Pachakagni directly influences the activity of Dhatwagnis. It further emphasizes that the excitation (Atiyoga) or inhibition (Heenayoga) of these Agni leads to corresponding imbalances in the Dhatus, leading to either excessive accumulation or degeneration of Dhatus, ultimately contributing to disease formation (Vyadhi Utpatti).⁷

Ayurvedic Explanation and Modern Correlation

Atyagni or Tikshnagi (Bhaskama)—Excessive excitation of the digestive fire (Tikshnagni) as abnormally rapid digestion of food without contributing to strength or nourishment—a condition referred to as Balabhramsha (loss of vitality). When sustained, this hypermetabolic state begins to consume the body's own Dhatus (tissues), leading to progressive debility. The person may experience temporary relief immediately after eating but soon develops symptoms of exhaustion and faintness once digestion is completed. This pathological state may progress to serious illness and even death.⁸ Vijayarakshita, excessively heightened digestive fire (Tikshnagni) manifests as a condition known as Bhaskama, wherein not only the ingested food is rapidly digested but the

metabolic fire begins to consume the body's own tissues. This leads to a progressive depletion of Dhatus, resulting in Balabhramsha (loss of strength), emaciation, and chronic debility⁹.

The moieties of Pachakagni, via the Dhatwagnis, pervade each tissue and govern their specific metabolic activities. Hyperactivity of these tissue-specific Agni causes Dhatu Kshaya (tissue depletion), while their hypoactivity—such as in Medodhatwagni Mandya—leads to poor tissue transformation and excessive accumulation.

Mandagni refers to a state of diminished digestive and metabolic fire, which leads to improper digestion and impaired tissue nourishment. In such a condition, certain Dhatus like Meda (adipose tissue) tend to undergo Vriddhi (abnormal increase), while others like Mamsa (muscle tissue) may show Kshaya (depletion). This pathological state bears close resemblance to the hypometabolic condition seen in hypothyroidism in modern medicine¹⁰.

Sthoulya (Obesity)

Sthoulya is a pathological condition characterized by excessive accumulation of Meda Dhatu (adipose tissue/fat) and Mamsa Dhatu (muscle tissue), particularly around the abdomen, buttocks, and breasts¹¹. It is classified under Santarpanajanya Vyadhi (diseases caused by over-nourishment). A key pathological factor in Sthoulya is Medo Dhatwagni Mandya—the hypoactivity or dysfunction of the metabolic fire specific to the Meda Dhatu. Medo Dhatwagni is responsible for the proper transformation of Rasa and Rakta Dhatus into Meda Dhatu¹². When this Agni becomes Mandya (diminished), the transformation is impaired, resulting in:

- Overproduction of Meda (adipose tissue)
- Poor quality Meda, which accumulates abnormally
- Inadequate nourishment to subsequent Dhatus like Asthi and Majja.

This leads to clinical features of Sthoulya such as:

- Excess body weight
- Fatigue and breathlessness on exertion
- Excessive sweating
- Lethargy
- Poor metabolic efficiency despite high food intake.

Medas Dhatu Vikara and Prameha (Type 2 Diabetes)

Meda Dhatu Vikara—disorders of the adipose tissue—plays a central role in the pathogenesis of Prameha, particularly Kaphaja Prameha and Sthula Prameha. It occurs due to hypofunction of Jatharagni and Dhatwagnis, especially Medo Dhatwagni, which results in excessive and vitiated Meda leads to increased Kleda (moistness) and Ama (toxic metabolites), which infiltrate into Rasa, Rakta, and Mamsa Dhatus, eventually affecting Mootravaha Srotas¹³.

Rakta Dhatwagni Dushti

Rakta Dhatwagni governs the metabolic transformation and quality of Rakta Dhatu (blood tissue). When Rakta Dhatwagni becomes hypoactive (Mandagni) or deranged (Vishamagni), it leads to Rakta Dushti, which manifests as vitiated blood qualities (e.g., increased viscosity, toxins, abnormal flow). This creates a pathological milieu conducive to diseases involving blood vessels and circulation.

Rakta Gata Vata or Uchha Raktachapa (Hypertension)

Rakta Dhatwagni Dushti refers to an impairment in the metabolic processing of Rakta Dhatu, leading to increased volume or

thickness of blood (Rakta Vriddhi). This weakened Dhatwagni fails to metabolize nutrients or eliminate metabolic waste efficiently, causing Ama Sanchaya in Rakta. Dushti of Rakta Dhatwagni leads to production of impure, toxic, or unrefined

Rakta, which is unable to nourish the tissues properly. Vata becomes vitiated and aggravated due to obstruction caused by Ama, targeting Rakta Dhatu and its channels (Rakta Vaha Srotas)¹⁴.

Table 1: The correlation between Dhatwagni Dushti and modern metabolic disorders

| Dhatwagni Type | Associated Dhatu | Dushti Type | Modern Disease Correlation |
|----------------|------------------|------------------------------------|--|
| Rasaagni | Rasa Dhatu | Ama formation, sluggish metabolism | Chronic fatigue syndrome, Allergies |
| Raktagni | Rakta Dhatu | Excessive heat, inflammation | Hypertension, Skin disorders (e.g., psoriasis) |
| Mamsagni | Mamsa Dhatu | Tissue overgrowth or wasting | Myopathies, Muscular dystrophy |
| Medoagni | Meda Dhatu | Hyperlipidemia, excess fat | Obesity, Hyperlipidemia, Fatty liver |
| Asthyagni | Asthi Dhatu | Weak bones, degeneration | Osteoporosis, Arthritis |
| Majjagni | Majja Dhatu | Nervous system disorders | Multiple sclerosis, Neuropathy |
| Shukraagni | Shukra Dhatu | Infertility, reproductive issues | Infertility, Low libido, PCOS/PCOD |

DISCUSSION

The moieties of Kayagni, though primarily situated in the gastrointestinal tract, are disseminated throughout the body via their specific Dhatwagnis, permeating and regulating tissue metabolism. Classical texts suggest that a decline in the activity of these Agni (digestive and metabolic fire) leads to the pathological accumulation of Dhatus, whereas their heightened activity results in excessive tissue depletion. This dynamic underscores the critical role of Agni homeostasis in maintaining tissue equilibrium and preventing disease.

Clinically, hypothyroidism presents with features such as myxoedema, loss of physical and mental vigour, alopecia, thickening of the skin, and generalized oedema (Shotha). These manifestations parallel the Ayurvedic understanding of Mandagni-induced Meda Vriddhi, where unutilised and improperly metabolised Ahara Rasa leads to excessive fat accumulation, and Mamsa Kshaya due to poor tissue assimilation. The weight gain observed is not due to increased nourishment, but rather due to faulty metabolism—a key feature both in Mandagni and Hypothyroiditis¹⁵. The classical presentation of Atyagni closely resembles the pathophysiology of hypermetabolic states such as hyperthyroidism, where increased basal metabolic rate results in tissue catabolism, weight loss, and fatigue. It is characterized by an accelerated rate of cellular respiration, leading to excessive production of metabolic heat. As a result, the individual often experiences a persistent sensation of internal heat or warmth, a hallmark of hypermetabolic states such as thyrotoxicosis or systemic inflammatory conditions¹⁶.

Rasa Dhatwagni Dushti results in inefficient nutrient assimilation, leading to early Ama (toxic metabolic byproducts) formation. Clinically, this manifests as metabolic syndrome and insulin resistance, aligning with modern parallels like deregulated glucose transport and lipid metabolism.

Rakta Dhatwagni Dushti impairs the quality and function of blood, contributing to Rakta Dushti and Srotorodha (obstruction of channels). This can result in Hypertension and Atherosclerosis, which correspond with endothelial dysfunction and oxidative stress in contemporary science¹⁷. This Ama circulates with blood, disturbing its functions and increasing viscosity, inflammation, and reactivity. Impure, thickened, and obstructed blood disturbs the flow and light, mobile nature of Vata.

Mamsa Dhatwagni Dushti and Meda Dhatwagni Dushti lead to faulty lipid metabolism, causing excessive adipose accumulation and chronic inflammation. This underlies conditions like obesity, dyslipidemia, and non-alcoholic fatty¹⁸. Medo Dhatwagni Mandya can be conceptually linked to reduced lipid metabolism – leading to fat storage rather than utilization, Mitochondrial

inefficiency – contributing to lower basal metabolic rate, Insulin resistance – where cells fail to respond effectively to insulin, promoting fat storage. Adipocyte hypertrophy and inflammation – resulting in further metabolic dysfunction and systemic low-grade inflammation.

CONCLUSION

Dhatwagni Dushti provides a conceptual framework in Ayurveda that parallels and explains the mechanisms of modern metabolic disorders. Based on various clinical observations and Ayurvedic principles, it can be concluded that the state of Agni is significantly influenced by one's Ahara (diet) and Vihara (lifestyle). Depending on the nature of the causative factors (Nidana), Agni may manifest as Tikshnagni, Mandagni, or Vishmagagni. The balance of Dhatwagni is essential for maintaining metabolic homeostasis, and its disturbance can lead to Dhatu Dushti, contributing to a range of metabolic disorders. Further, well-designed clinical studies are warranted to scientifically validate these correlations and enhance integrative understanding. The approach not only enhances our understanding of disease but also opens new integrative pathways for treatment.

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Cite this article as:

Akanksha Chauhan. Pathophysiological role of Dhatwagni dushti in chronic metabolic disorders: An integrative review. Int. J. Res. Ayurveda Pharm. 2026;17(2):154-157 DOI: <http://dx.doi.org/10.7897/2277-4343.17268>

Source of support: Nil, Conflict of interest: None Declared

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