

UNDERSTANDING AMA AND ITS ROLE IN DISEASE DIAGNOSIS

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Abstract

Ama is a fundamental pathological concept in Ayurveda, described as an improperly digested or unprocessed metabolic by-product formed due to hypofunctioning of Agni. Mandagni leads to the formation of Apakwa Ahara Rasa, which undergoes fermentation and putrefaction, resulting in Ama. Classical Ayurvedic texts describe multiple levels of Agni—Jatharagni, Dhatvagni, and Bhutagni—and impairment at any of these levels contributes to Ama formation. Ama possesses distinct biophysical properties such as heaviness, stickiness, foul smell, and obstructive nature, which enable it to combine with Dosha and Dusya, forming Sama-dosa-dusya complexes. Systemic circulation of Sukshma Ama leads to Srotorodha and Khavaigunya, resulting in various gastrointestinal and systemic disorders, notably Amavata. Clinically, Amavata shows striking similarities with Rheumatoid Arthritis (RA), an autoimmune disorder. The present article reviews the classical concept of Ama, its formation, properties, and systemic effects, and explores its antigenic potential in relation to the pathogenesis of rheumatoid arthritis.

Introduction

Ayurveda emphasizes the maintenance of health through the equilibrium of Dosha, Dhātu, Mala, and Agni. Among these, Agni occupies a central position, as it governs digestion, metabolism, and tissue nourishment. Any disturbance in Agni leads to the production of pathological substances, of which Ama is the most significant. Ama is described as an unripe, undigested, toxic product formed due to Mandagni, and is considered the root cause of numerous diseases.

Classical texts such as Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya describe Ama as a crucial factor in disease causation, especially in chronic, inflammatory, and metabolic disorders. The concept of multiple Agnis—Jatharagni, Dhatvagni, and Bhutagni—provides a comprehensive framework for understanding digestion and metabolism at gastrointestinal, tissue, and molecular levels.

Amavata is one of the diseases where Ama plays a pivotal role, and its clinical features closely resemble those of Rheumatoid Arthritis. Modern medicine recognizes RA as an autoimmune disorder, though its precise etiology remains unclear. Exploring the concept of Ama through both classical Ayurvedic and modern biomedical perspectives may offer valuable insights into the pathogenesis of autoimmune disorders and open avenues for integrative approaches to treatment.

Concept of Ama

The term 'Ama' refers to the raw, unripe, unprocessed or maldigested (indigested) condition of food substances, probably due to the result of Angi mandata (i.e., weakness of Agni (digestive power)).

The concept of Agni is very unique in Ayurvedic texts. As per its description, there are thirteen types of Agnis (C.S. Ci. 15/3-40). Vagbhata also described seven pakakas, which are directly related to Agni (As. S. Su. 19/16-18).

Types of Agni:

1. Jatharagni (One): Pertaining to digestion of GIT
2. Dhatvagni (Seven): Agni at tissue level
3. Bhutagni (five): Agni at the cellular / molecular level

Among these thirteen types of Agnis, the jatharagni is considered the most important Agni. The entity and function of all other Agnis depend on the proper functioning of it (CsS. Ci. 15/39).

According to the Ayurvedic viewpoint, Mandagni is the main causative seat for a large number of diseases as described in Kayacikitsa. Ama Rasa and Ama Anna (Anna Visa) are the two states of Ama which result due to impairment of Kayagni. Both stages are pathogenic and give rise to a number of gastrointestinal (Ajirna, Visuchika, Vilambika, Alasaka, Jwara, Atisara, Pravahika, considered under Anna Visa Janya Vyadhis) and other disorders related to systemic conditions like Grahini Dosa, Udara roga (mainly Jalodosa), Prameha, Pandu, Amavata, etc.

Hence, the proper knowledge of Ama is very essential in order to understand the pathology of disease and for the approach of proper treatment.

According to Vagbhata, Ama as a pathological entity is formed due to hypofunctioning of Ushma (Agni (As. Hrit. Sut 13/25)); as a result of it, the Rasa and Rasa dathu are not properly formed; instead, the Apakwa Anna rasa is collected in the Amashaya and there it undergoes fermentation followed by putrefaction. This very state of Apakwa Anna rasa is termed as Ama. Sarangdhara views Samyak Pakwa Ahara as Rasa and Apakwa Ahara as Ama (Sa Sam Poorva Khanda – 6).

Formation of Ama and its biological entity

The food (Ahara) which is taken by us is not digested properly because of Mandagni, leading to the formation of Apakwa Ahara Rasa, which undergoes Suktatwa in due course of time, and it is this Suktabhava of Apakwa Ahara Rasa which is termed as 'Ama' or 'Amadosa'. The toxicity or virulence or dosatwa of Ama Rasa depends on the degree of Suktabhawa.

Cakrapani comments that Suktabhawa is Amlatwa (Ca. Ci. 15). While considering the above facts, production of Ama can be depicted as follows. The dietetic indiscretions and emotional stresses impair the proper functioning of the neurohumoral mechanism responsible for ensuring proper secretion of digestive juices. The consequence of this hyposecretion of digestive juices and sluggish gastrointestinal motility leads to fermentation (Sukhatwa), the production of foul odour (i.e., Durgandhatwa) and extreme pastiness (i.e., Bahupicchilatwa) of Ahara rasa. The process of fermentation is most probably due to starch and carbohydrate components present in Ahara, and the foul odour and pastiness are probably due to petrification of the protein components. So the outcome of these changes attains toxicity in the body and thus can be compared to Amavisa.

Characteristic of Ama (Bio-physical properties of Ama):

Vijayaraksita in his Madhukosa commentary on Madhava Nidana (Amavata Nidanam) and Arunadutta in his commentary on Astang Hridaya (Su. 13/27-28) have very nicely described the following characteristic of Ama.

- i) Gurutvam (having high specific gravity)
- ii) Dravatvam (liquid in nature)
- iii) Nana Varnatvam (having different colours)
- iv) Tantumatvam (having sticky property)
- v) Asamyuktam (non-homogenous or unmasked)
- vi) Snigdhatvam (having an oily or moist consistency)
- vii) Durgandhatvam (foul smelling)
- viii) Picchilatvam (stickiness)

Production of Ama at different biological levels:

Ama is produced at three different levels:

- 1. Jathargni level (GIT level)
- 2. Dhatvagni level (tissue level)
- 3. Bhutagni level (molecular level)

Dalhana, in his commentaries on Susruta Samhita (Sus. Sci. 15/35), has narrated that the formation of Ama is not merely by Jatharagni mandyata; instead, it can also occur due to impairment of Dhatwagni Vyapara (Atanka Darpen / M. Ni. 6/22).

The formation of complexes with Dosa and Dusya by Ama is termed the Sama-dosa-dusya state. The following symptoms are produced by Sama dosas.

- 1. Akasta - Lethargy
- 2. Gaurava - Heaviness in body
- 3. Sroto avarodha - Obstruction to micro channels

4. Aruchi - Loss of taste
5. Bala bhramsa - Reduction in physical strength
6. Klama - Easy fatiguability
7. Anila Mudhata - Easy fatiguability
8. Apakti - Indigestion
9. Malasang - Constipation
10. Nistiva - Expectoration

Characteristics of Sama Vayu:

These are as follows:

- Constipation
- Flatulence
- Distension of abdomen
- Dyspepsia
- Abdominal discomfort
- Pain
- Gurgling sound of intestine

Ama – At the Systemic Level

Ama in the form of Sukoma Ama rasa comes into the systemic circulation, which is not suitable for either Dhatwagni Paka or Bhutagni Paka because its initial Apakwata in its nature becomes a Vijatiya dravya (i.e., foreign body) for the body because of its macromolecular size. Further, it vitiates the Doshas present in the body to cause different kinds of disorders depending on the severity and (level) site of its location.

Ama is a very hazardous substance; being macromolecular in size, it causes obstruction to the microchannels (Srotoavawdha / Khavaigunya) by macromolecules. It thereby means that Ama Rasa is bigger than the size of normally absorbable micromolecules.

Due to the similarity of its biophysical properties with slesma, Ama rasa trickles to the Slesma sthana and accumulates there. At slesma sthana it further vitiates and comes into general circulation in the body; here onwards it forms complexes with various dosas and is converted into extremely virulent substances which get localised into various multiple joints, leading to inflammatory changes as seen in amavata disease.

Thus, from the abovementioned facts, it can be concluded that the circulating Suksma Ama Rasa is a morbid factor responsible for producing Ama Vata.

Antigenicity of Ama:

Clinical findings suggest Amavata and rheumatoid arthritis are very similar to each other. As we already know that rheumatoid arthritis is an autoimmune disease, and its actual aetiology to date is not yet confirmed.

There are certain triggering factors, like genetic and environmental factors, which are responsible for inducing RA in genetically susceptible individuals. These factors can be exogenous or endogenous in nature and are supposed to act as an antigen. An antigen is a substance which is basically protein in nature, and when it gets into the human body, it stimulates or initiates the production of antibodies.

Antigens are of two types, and these cause immune complex-mediated tissue injuries.

1. Endogenous antigen: These are components of blood (antigens in cells/tissues).
2. Exogenous antigens: Infective organisms like bacteria, viruses, fungi, parasites, drugs and chemicals, along with food (Ahar)

Due to low function of Agni (hypofunction) or due to mandagni, Ama is produced. Ama can also be produced due to consumption of Viruddha ahara (as an exogenous source).

Vagbhatta first of all mentioned that Ama is formed internally without the involvement of Agni and Ahara; according to him, excessively vitiated dosas may combine together to form Ama inside the body (endogenous production of Ama) (As. Hri. Su 13/24).

Thus the Ama produced due to exogenous and endogenous sources becomes unwholesome to the body and can be depicted as an antigen which is very much capable of inducing an immunological reaction in RA. According to Ayurveda, the fate of Ama biologically is a mixture of undigested protein, fat, carbohydrate and some type of bacterial form.

Thus, by looking into the above points, it can be concluded that the following facts regarding the role of Ama in the pathogenesis of rheumatoid arthritis.

1. Ama acts as an exogenous antigen by virtue of its protein and bacterial floral contents.
2. Ama acts as an antigen and possesses the potency to induce an immunological reaction in a susceptible individual.
3. Ama can also be generated within the body (endogenous ama) by virtue of excessively vitiated doshas (autoimmune).

Discussion

The formation of Ama primarily results from Mandagni, leading to improper digestion of Ahara and subsequent formation of Apakwa Ahara Rasa. Over time, this Apakwa Rasa undergoes Suktabhava, characterized by fermentation, sourness, foul smell, and increased viscosity. Chakrapani describes Suktabhava as Amlatwa, while Sarangadhara clearly differentiates Pakwa Ahara as Rasa and Apakwa Ahara as Ama.

Ama possesses specific biophysical properties such as Gurutva, Picchilatva, Snigdhatva, Durgandhatva, and Tantumatva, which render it capable of obstructing microchannels (Srotorodha) and forming complexes with Dosha and Dusya. This Sama-dosa-dusya state

manifests clinically as lethargy, heaviness, indigestion, constipation, anorexia, and reduced strength.

Importantly, Ama formation is not restricted to the Jatharagni level. Impairment of Dhatvagni and Bhutagni also leads to Ama production, resulting in systemic circulation of Sukshma Ama Rasa. Due to its macromolecular nature, Ama behaves as a Vijatiya Dravya (foreign substance), interfering with normal tissue metabolism and immune regulation.

From a modern biomedical perspective, Ama can be compared to antigenic substances composed of undigested proteins, fats, carbohydrates, and microbial components. This explains its antigenic potential and its ability to trigger immune complex-mediated inflammatory reactions. In Amavata, Ama localizes in Shleshma Sthana, especially joints, leading to chronic inflammation and pain, closely paralleling the pathophysiology of Rheumatoid Arthritis.

Vagbhata's description of endogenous Ama formation—through excessively vitiated Doshas even in the absence of Ahara and Agni—provides a remarkable Ayurvedic explanation for autoimmune phenomena. Thus, Ama may act both as an exogenous antigen (derived from food and microbes) and an endogenous antigen (autoimmune origin), capable of initiating and perpetuating inflammatory joint disease.

Conclusion

Ama is a central pathological entity in Ayurveda, originating from impaired Agni at gastrointestinal, tissue, or molecular levels. Its unique biophysical properties enable it to obstruct channels, vitiate Doshas, and form pathogenic complexes, leading to a wide spectrum of diseases. In systemic circulation, Ama behaves as a toxic, antigen-like substance, capable of inducing immune responses.

The striking similarity between Amavata and Rheumatoid Arthritis suggests that Ama may play a role analogous to antigens involved in autoimmune pathogenesis. Both exogenous and endogenous production of Ama provides a comprehensive Ayurvedic explanation for immune dysregulation. Understanding Ama not only aids in accurate diagnosis and treatment planning in Ayurveda but also offers valuable insights into chronic inflammatory and autoimmune disorders from an integrative perspective.

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