

## CRITICAL EVALUATION OF AMA

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## ABSTRACT

*Ama* is a Sanskrit word which literally means undigested or uncooked food materials. The concept of *Ama* is the most important and fundamental principle in understanding the physio-pathology of the diseases. In Ayurvedic classics *Ama* which is the product of metabolic defect. It is formed due to improperly metabolized by product of food at *Jatharagni* level (macro level), *Bhutagni* level (micro level) and at *Dhatavagni* level. *Ama* is mostly responsible for the development of various diseases process in the body. Its importance is also reflected by the word *Amya*, which is a synonym given to *Vyadhi*. *Dosha Prakopa*, etiological factors also play an important role in manifestation of *Ama*. Its action is like that of toxic substances that is called *Amavisha*.

*Ama* is not a single entity but is a generalised term, which can be applied to many malformed substances in the body i.e. free radicals. It brings the disease. Here also we can compare them with that of *Ama*. So any substance which is remained stable without any *Paka* or remained as residual during improper metabolism can be considered as *Ama*, such as ketone, uric acid, cholesterols etc. The role of these factors is all ready established fact in certain auto immune disorders. So *Ama* is considered as a root cause of all disorders in Ayurveda. The product of digested is generally utilized or excreted. But if cannot be utilized or excreted, that toxic substance remain in the body and vitiated the body tissue mechanism. The tissue loses their structural or functional integrity. Thus even hypercholesterolemia, hyperglycaemia, hyperaemia, hypertriglyceridemia and all the biochemical values when in the excess and cannot be utilized or excreted from the body, are called *Ama*.

**Keywords:** *Agni, Ama, Amavisha, Digestion, Dhātu, Dosha, Mala, Metabolism, Free radical, Toxins.*

## INTRODUCTION

*Ama* the term is literally means raw, unripened, uncooked, unbaked, immature and undigested. *Ama* is produced when the *Agni* (*Pachakaagni* i.e. *Jatharagni*) is slow and low (*Mandagni*).

*Ama* is a peculiar concept in Ayurveda, for which modern chemistry has no correlate. In Ayurvedic classics, *Ama* which is the product of metabolic defect it has been considered an important factor for the pathogenesis of most of the dis-

eases and also in modification of disease process. Its importance is also reflected by the word '*Amya*' which is a synonym to the *Vyadhi*.

**Etymology-**

The word '*Ama*' is, the combination of '*Am*' *dhatu* with '*Nich*' *pratyaya* forms the word *Ama*, which is subjected to digestion i.e. undigested or unprocessed matter.<sup>1</sup>

The word *Ama* is derived from *Ama Dhatu* with the suffix 'A'. It means improper or partially digested matter.

The word *Ama* found in Ayurvedic literature is incompletely fermented and unripened substances.<sup>2</sup>

**DEFINITION OF AMA** - In Ayurveda various definitions of *Ama* are quoted in the texts, some of which are as follows-

Due to poor strength of *Agni* (*Jatharagni*), initial *Rasadhatu* becomes immature improperly metabolised and this unmetabolised substance i.e. *Annarasa* is still left in stomach is known as *Ama*. This *Annarasa* undergoes fermentation (*Dush-tata*) being retained in the *Amashaya* (stomach and small intestine) called *Ama-rasa*.<sup>3/4</sup>

- If *Kayagni* fails to perform normal functions leads to accumulation of undigested food material inside *Amashaya*, which is the initial *Rasadhatu* is called *Ama*.<sup>5</sup>
- The food residue which is not digested due to impairment of *Agni* is known as *Ama* and it is said to be the root cause of all the diseases.
- Other meanings of the word *Ama* found in Ayurvedic literature are- incompletely, fermented and unripened substance, unbaked and incompletely developed substance, and unprocessed substance.

From the above definitions it is clear that *Agni* (*jatharagni*) plays an important role in the production of *Ama*. **The relationship of Agni and Ama** - *Jatharagni* or *Koshagni*, *Panchbhutagni*, and *Dhatvagni* are the main three *Agni* present inside the body. *Jatharagni* is the digestive fire that controls the various digestive processes within the body. When there is hypofunctioning of *Agni* proper digestion is hampered resulting in the formation of *Ama*. Then *Bhutagni* have been

enumerated, *Bhuta* means the physicomaterial classification of food and body elements. Thereafter *Dhatvagni* have been expounded, *Dhatu* here means the basic elements of the body. The functions of *Dhatvagni* refer to tissue (*Dhatu*) metabolism. In sum, *Jatharagni* (gastro-intestinal metabolism secretion, enzyme), *Bhutagni* (five intermediary metabolism factors) and *Dhatvagni* (tissue metabolism) constitute the thirteen types of *Agni* or Metabolic factors of Ayurveda. By the Ayurvedic literature, the food material is first digested and absorbed by the *Jatharagni* in *Amashaya* and *Grahani*. Then it is transported to the liver for *Bhutagni Paka* and from there, the product of nutrition is processed in the tissues by the *Dhatvagni*. Normally digestion at all levels proper functioning of these *Agni* is absolute necessary. But, whenever *Agnivyapara* took the shape of *Mandagni*, the resultant material will be unripened, undigested formation of what in Ayurvedic terms is known as *Ama*. In terms of metabolism, it is defective metabolism.<sup>6</sup>

#### **AETIOLOGY OF AMA-**

From the above discussion, it is clear that *Jatharagni* is the root cause of *Ama*. So the factors responsible for malfunctioning of *Agni* are also responsible for *Ama*. Charaka described the aetiological factors in details.<sup>7</sup>

1. *Aharja- Abhojana* (fasting), *Atibhojana* (Overeating), *Ajir nabhojana* (in state of indigestion), *Vishamashana* (irregular dirt habits), *Asatmyabhojana*, *Virudhhabhojana* (indulgence in diet) not homologous to body, food qualities like *Guru* (heavy), *Sheeta* (cold), *Shuska* (dry), *Ruksha* (fat deficient food), *Vidahi* (acidic), *Viruddha ahara* (incompatible diet) leads to the failure of digestion of even easily digestible food.

2. *Viharaja- Sandharnata* (suppression of natural urges), *Svapna viparyaya* (keeping

awakening in night and sleeping in days), *Dukhashayya* (uncomfortable bleeding), *Atyambupana* (drinking of water excessively) may give rise to *Amadosha*.<sup>8</sup>

Iatrogenic Causes - Erroneous inadequate administration of *PanchakarmaVidhi* i.e. *Vaman*, *Virechana*, *Basti Karma*, *Sneha Karma* can also produce *Ama*.

3. *Mansika*- Consumption of food while afflicted with mental upset due to *Kama* (Lust), *Krodha* (anger), *Lobha* (greed), *Moha* (temptation), *Irshaya* (jealousy), *shoka* (Mental stresses, grief), *Bhaya* (fear), *Lajja* (shame), *Chinta* (worry) are responsible for *Agnimandyajanya Ama*.

Miscellaneous- *Desha*, *Kala*, *Rhutu Vaishmya* (adverse seasons habitats and time), *Vyadhikarshana* (emaciation due to chronic disease), also give rise to *Ama*.<sup>9</sup>

### **SAMPRAPTI (PATHOGENESIS) OF AMA-**

As described in following lines attempt has been made to understand the process of formation of *Ama*. The primary source of *Ama* is the digestive system. *Ama* produced in liver also or at other tissue or cellular level, depending on the etiological factors.

**A.** *Ama* produced as a consequence of *Agnimandya* –

Almost all the Acharyas are of the opinion that malfunctioning of the *Agni* leads to the production of *Ama*. Normally, whatever type of food consumed is firstly acted upon by *Jatharagni* in *Amashaya*.<sup>10</sup>

Then it is transported to the Liver for *Bhutagni paka* and thereafter the product of nutrition is processed in the tissues by *Dhatavagni*. So it is obvious from the above description that the metabolism or *Agnivyapara* may be defective at three levels which are described as under -

**1.** *Ama* produced by *Jatharagnimandya* – Normal activity of *Jatharagni* is essential for the complete and proper digestion of

food. But due to low *Jatharagni* the food is not properly digested and *Ama* is formed. Therefore it's its absorption becomes sluggish due to its *Guna* like *Guru*, *Pichhila* and it gets retained in the intestine for a longer time.<sup>11</sup>

After sometimes virulent *Ama* undergoes fermentation and putrefaction and a new product having the properties similar to *Visha* toxic is formed, the termed as *Ama-Visha* and it is the root cause of all diseases.<sup>12</sup>

**2.** *Ama* produced by *Bhutagnimandya* – After completion of breaking down of food particles by *Jatharagni*, the *Bhutagni* digest the particles of their own.<sup>13</sup> When *Bhutagni* do not act properly *Ama* will be produced.

**3.** *Ama* produced by *Dhatavagnimandya* - *Dhatavagni* plays a role in the process of formation of *Dhatu* tissue from the nutrient substances of the particular *dhatu*. Hence when the power of the *Dhatavagni* of a particular *Dhatu* is diminished, either in the liver or in a particular *Srotasa*, the formation or utilization of that *Dhatu* becomes incomplete and *Ama* is produced

**B.** *Malasanchayajanya Ama* - (Accumulation of waste product in body)

*Agni* is the energy responsible for transformation of food substances, which is converted to *Dhatu*s, and *Upadhatu* are produced. This is anabolic activity of *Dhatavagni*. During this process, *Dhatu* substances again digested disintegrated and utilized for the liberation of heat and energy by the *Dhatavagni*, this is catabolic process. At that time certain minute waste products are formed i.e. *kleda*, and the excess *kleda* is excreted from body. When this excretion becomes inadequate due to excessive production it gets accumulated in the body and stagnation of these *mala* in *srotasa* cause *srotorodha*. These being exert adverse effect on digestion and metabo-

lism and that metabolic waste can be considered as *Ama* i.e. blood urea uric acid, cholesterol etc. Lead to various disorders.

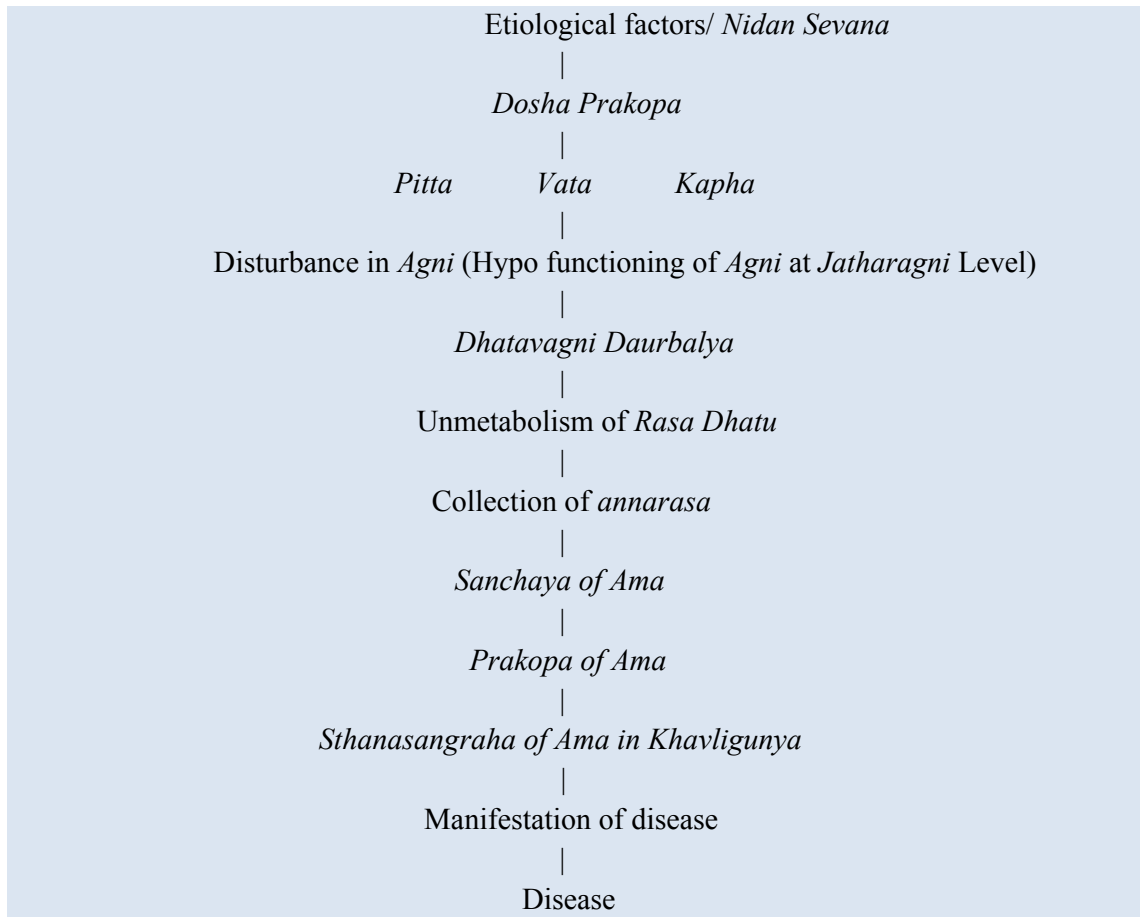
C. *Dosha-sammurcchana* – Interaction between vitiated *doshas*.

The first stage of vitiation of *Dosha* is *Sanchayavastha* (accumulation in their own places) <sup>14</sup> Every *Dosha* has certain qualities. After vitiated *doshas* combined

each other, they produce interaction between them in such conditions of opposite qualities, instead of nullifying each other interact and produce a toxic substances i.e. *Ama*.

D) *Krimi Visha* (Bacterial toxins) –When an infection is caused by the pathogenic organisms, they liberate a toxic substance, (i.e. Endo-toxin & Exo-toxin)

### Formation of *Ama* -



### Properties of *Ama*-

Due to the consumption of *nidana*<sup>15</sup>, which are capable of exacerbating *dosha* and brining mildness in *Agni*, after this whatever is again eaten or drunk by ignoramus person, the same becomes improperly digested this transformed into sourness in *Amashaya* is called *Amavisha*.<sup>16,17</sup>

**Sama** - is a condition manifests due to amalgamation of *dosha* and *dushya* (*Dhatu*

& *Mala*) resulting into the formation of various kinds of disorders. *Vyadhi*, which engendered from *Sama* are also known as *Samavyadhi* in *Ayurveda*.<sup>18</sup>

*Ama* is *Avipakwa* (undigested), *Asanyukta* (not well formed). It is always in the form of incompletely digested substance. It is non-homogenous, has a very bad or foul odour, which can be experienced only when it is combined with excretory products such as sweat, urine and

stool etc. It is always very sticky and greasy or mucoid in nature<sup>19</sup>. The product of digestion and metabolism is generally utilized or excreted out. But if that cannot be utilized or excreted, they remain in the body and vitiated the body tissue mechanism (i.e. *Dhatusamata*). The tissue lose their structural or functional integrity.<sup>20</sup> When such things collect in the body it produces lethargy in body.

#### **Role of Ama or root cause of disease -**

*Ama* originates from improperly digested toxic particles that clog the *srotas* in body. Some of these *srotas* are physical and include the Gastrointestinal Tract, lymphatic system, Arteries and Veins, Capillaries and Genitourinary tract also Respiratory and Cardiovascular system. Others or nonphysical *srotas* called *Vatanadimandalas* (CNS) through which your energy flows. *Ama* the toxic substance accumulates wherever there is a weakness in the body and this will result in disease.

*Ama* itself act as a disease, sometimes becomes too toxic to the body by its manifestation and starts as a toxic agent i.e. *Amavisha* and become difficult to treat; besides this *Ama* also produces various disorders, called *Amadoshaj Vikara*.<sup>20</sup> So, *Ama* is root cause of all diseases.

#### **Ama in modern view-**

*Ama* is a concept that can be understood as accumulated of unutilized, unmetabolised due hypofunctioning of digestive and metabolic enzymes. This untransformed food material accumulates in the gastro-intestinal level (*Ama-Annarasa*), metabolic waste (*Malasanchaya*). *Ama* is state of intermediately metabolites which are toxic in nature, hinders the absorption products of digestion increase or decreases the peristalsis and on absorption produces gastrointestinal disorders as well as extra

gastrointestinal disorders. Sometimes due to external negative influences (e.g. emotional stress, strains, adverse weather, inappropriate food and habits) and improper secretions of digestive juices by liver and pancreas, not all the food digested. In that half of it absorbed as a nutrients and rest of it, as a waste products. But there still remains a half undigested, unmetabolised food product that circulates in the body as toxins.

*Ama* is also considered as an accumulation of *Mala* (egests and metabolic by products) in the body during process of digestion and metabolism leading to development of various ailment.

*Ama* lines the walls of the bowel, impeding absorption and assimilation of nutrients. This toxic material *Ama*, can be viewed as a foreign toxic substance by the body and the immune system can react by forming antibodies to it, giving rise to antigen-antibody complexes and resulting in immune disorders. During the physiology there is accumulation of impurities and toxins, from inside the body come internal metabolic and cellular waste products, such as free radical damaged cells and tissues and from outside come external impurities such as pesticides (from food & water), pollutants (from air) and toxins that occur naturally in foods. All these are collectively referred to as *Ama*. In modern parameters, *Ama* is supposed to be free radicals. It is a molecule that contain unpaired electron, they are unstable chemical formed in the body during metabolism and cause degenerative changes also diseases. *Ama* in the blood vessels can be understood as the accumulation of lipids and other substances in the walls of the blood vessels in results of blockage, in the joints Stiffness and so on.<sup>21</sup>

#### **SYMPTOMS OF AMA -**



*Ama* presents features as per its fusion with specific *Dhatu* or its location. General characteristic of *Ama* are, *Srotorodha* (obstruction of channels), *Balabhransha* (loss of strength), *Gaurava* (feeling of heaviness), *Anilmudhata* (obstruction of *vayu*), *Alasya* (laziness), *Apakti* (indigestion), *Nisthiva* (excessive salivation), *Malasanga* (constipation), *Aruchi* (anorexia), and *Klama* (fatigueness).

### 1. Presence of *Ama* in the body, diagnostic criteria-

On the presence of *Ama* in the body, we can correlate the parameters to understand the changes in stool and urine. Stool floating test as mentioned by Charak.<sup>22</sup> Stool with *Ama* settles at the bottom, while Without *Ama* float on the surface of water, on pouring patients stool in full of water tank, stool also having physical changes in colour, foul smelling and consistency. Urine shows slimy, foul smelling, high specific gravity and varying in colour.<sup>23</sup> By the laboratory investigation which includes detection of specific auto-antibodies, agglutination reaction tests, ELISA test etc. Used to detect various auto-immune disorders.<sup>24</sup>

*Sama* is state of intermixing of *Ama* with *Dosha*, *Dhatu* and *Mala* indentified by the specific features of *Sama-dosha*, *Sama-dhatu* (*Sama-dushya*), and *Sama-mala*. Symptoms of *Ama* aggravated by *Snehana*, in the morning hours, at night and during the cloudy atmosphere.<sup>25</sup>

### DISCUSSION:

*Ama* is a generic term for food that is absorbed into the system without having first been properly digested. Such material cannot be used by the system and acts to clog it.

It is cleared from above citation that *Ama* is the resultant of hypofunctioning of *Jatharagni* as well as *Dhat-*

*vagni*. There are mainly three levels of *Ama* viz - *Ama annarasa* (untransformed food material) at the gastrointestinal level, *Malasanchaya* (collect of metabolic waste) and *Prathma Dosha-dusti* (sudden vitiation of *Dosha* due to extrinsic factor). *Agni* becomes impaired because of an imbalance in the *Tridosha*, the metabolism is drastically affected food materials remain undigested and unabsorbed. That material Posses the property of *Visha* or toxin substance, accumulate in the body, which is called *Ama*. Due to low and slow of *Agni* leads to formation of improperly digested initial *Rasadhatu* or *Annarasa*, this undergoes fermentation and putrefaction being retained in the *Amashaya*, called *Amarasa*, i.e. *Ama*. It has been described as sticky, foul smelling toxin substance within the body. *Ama* also formed by bacterial invasion. Bacteria emit toxins into the system and aggravate *Ama*. The body has a capacity to acclimatize even the changes in weather. But when these two i.e. digestion and metabolism is poor or acclimatization cannot properly take place, some foreign material is accumulated, called as *Ama*.<sup>27</sup>

As per modern theory, the structural changes in the enzymes at level of Transcription or translation can lead to production of intermediary metabolite i.e. free radical. similarly *Ama* is also being produced whenever there is Malfunction of *Agni* in the body .The action of various enzymes as the action of *Agni* by Ayurveda so it is true that impairment of *Agni* at cellular level causes the generation of free radicals i.e. *Ama*.

*Ama* i.e. impure material (*Ama* or free radical) have tendency to create clogs the intestine and other channels, at different level (i.e. micro and macro level) and undergoes many chemical changes which create toxins. These toxins are absorbed into the blood and enter the general circu-

lation they eventually accumulate in the weaker parts of the body i.e. *Kha-Vaigunya*, where they create contraction, clogging, stagnation and weakness of the organs and reduce the immune mechanism of respective system or tissue. Once settled, *Ama* begins affecting the body and the mind both structurally and functionally, thereby producing disease.

#### Critical Evaluation of Ama:

The main factor for the formation *Ama* is deranged functions of *Agni*. If it remains for longer duration in *Amashaya*, it becomes as like *Amarasa (Visha)* which is termed as *Amavisha*. The hazardous effect of *Ama* depends on the attainment of the degree *Amavisha*, which decides the prognosis or process of diseases. *Ama* Produces – The dietetic indiscretions and emotional stress may impair the effective functioning of the neurohumoral mechanisms as a result *Ama*, develops inside the body. Hyposecretions of digestive juice and retarded gastrointestinal motility leads to the fermentation in food materials and result in a thick, slimy product of foul smelling and extreme stickiness.

There may be two factors like, the hyposecretion of digestive juices and Diminished or sluggish gastro- intestinal motility lead to the fermentations in food materials and result in a thick, slimy, product of foul smelling with extreme stickiness. *Malasanchaya* the term, may be to designate *Ama* and *Sama*. The word mala i.e. egests and the by product of metabolism (metabolic waste products), the products not properly utilized or eliminated by the body. *Ama*, *Amadosha*, and *Amavisha* play a vital role in the pathogenesis as well as prognosis of disease. Certain chemical compounds in the body does damage which accumulates to produce ageing are called free radicals, considered as *Ama*. Increase in the normal

values of blood, urine, stool, semen, sputum, salivary secretion etc. may be understood as *Ama* condition. Direct influence of *Ama* observed in *Amavata*, *Vatrakta*, *Grahani roga*, *Kasa*, *Pandu*, *Kamala*, *Kushtha* etc.<sup>28</sup>

Through study of the Ayurvedic literature reveals that *Ama* not only produces local gastrointestinal disorders, but also generates various extra gastrointestinal disorders.

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Source of support: Nil  
Conflict of interest: None