

## CRITICAL EVALUATION OF AMA CONCEPT AND ITS CLINICAL SIGNIFICANCE

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### ABSTRACT

*Ama* in ordinary parlance means things like unripe, immature, unprocessed, undigested or incompletely oxidised/metabolised or similar to a toxin. Essentially it is a form of un-metabolized waste that cannot be utilized by body. Due to hypo functioning of *ushma (Agni)*, the first *dhatu rasa* is not properly formed instead *annarasa* undergoes fermentation or putrefaction and is retained in the *amashaya*. Result of this is the succeeding *dhatu* is also not formed in a proper way. *Ama* is formed as a result of *mandagni* and in Ayurveda it is stated that *mandagni* is the main reason behind any disease to occur specially diseases of gastro-intestinal tract. The concept of *Ama* and free radical theory has various similarities. After studying *Ama* it becomes clear that *Ama* is not a single entity but is a generalised term that can be applied to many malformed substances in the body.

**Keywords:** *Agnimandya*, *Ama*, Free radicals, Toxins.

### INTRODUCTION

According to Ayurveda the synonyms of disease is 'Aamay' that means most of the disease produced due to *Ama*. *Ama* is described as substance, which is not digested properly and need further digestion or a substance which is incompletely metabolized or partially metabolized is called *Ama*. Also the substance which creates disturbance in *srotas* (channels) could be included as *Ama*. Thus *Ama* means a substance or group of substances which is similar to poison or act like a poison. There are definitions of *Ama* available in different classics. Though the disease associate with *Ama* have been described *Charaka & Sushruta* but *Vagbhata* was perhaps the first author to define *Ama* as a separate entity. According to him; *Ama* is due to hypo function of *ushma (Agni)*, the food which not completely or properly digested, yields

immature *rasa* in *amashaya* and due to its retention, undergoes fermentation or putrefaction.<sup>1</sup>

Though the description of *Ama* being developed in *amashaya* has been described here, but the word *Ama* has a generalised meaning which can be applied to any sort of working *agni* in the body. Also it is stated that food if not digested properly due to hypo function of *Agni* the name *Ama* and becomes the root cause of many disease.<sup>2</sup> Here the three different opinions about *Ama* are compiled by *Vijayarakshita*. First view is about the improperly digested food. Second view described the accumulation of *malas* in the different parts of body termed as *Ama*. Third view is about the stages of *dosha-dushti* or disease, which says the first stage of *dosha dushti* or disease is *Ama*. The poisonous characteristic of

*Ama* has once again been highlighted by *Acharya Vagbhata* quoting that '*Amadosha*' is very dreadful and hence is considered as poison.<sup>3</sup> This type of poison causes different types of diseases in the body and it is very harmful to our body. Also it affects different *srotas* of body which leads to serious disorder. Therefore, study of concept of *Ama* is essential for understanding basic pathophysiology of disease and its ill effect on *srotas* in the body.

### MATERIALS AND METHODS:

This study has been done based on critical review of classical information, Published research work and modern literature. The possible correlation has been made between collected information and has been presented in systematic way.

### DISCUSSION

In Ayurveda the concept of *Agni* is of central importance, the strength of *Agni* in the body is among the most critical factors in determining overall health. Feeble action of *Agni* is the root cause of *Ama* production. So it is quite clear that anywhere in the body, if *Agni* is not working properly, *Ama* might be produced. By contrast, *Ama* is a toxic, disease causing substance that form as a result of impaired *Agni*, and that, in turn, destroys *Agni*. In this way, impaired *Agni* and the creation of *Ama* routinely enter into a vicious and self-perpetuating cycle. Unfortunately, the accumulation of *Ama* is leading to extremely detrimental to our health.

### CONCEPT OF AMA:

*Ama* is produce from *Ahara* rasa when it is not properly digested. In case of *jatharagnimandya*, the *Ahara* rasa is the undigested food but in case of rest of *agnis* it is the metabolites that are undergoing process of metabolism by these *agnis*. Place of origin of *Ama* is given as *Amashaya*. But considering the presence of *agni* at different level *Ama* can be produced at different levels at different sites in the body.

The different types of *Ama* depending upon their origin and properties depending upon *Agni*. *Ama* could be basically divided into two main categories. That which directly depends upon improper function of *Agni* and other role of *Agni* is insidious. The first category could be further subdivided into three sub-type depending upon the type of *Agni*. Foremost in these is *Ama* produced by default of *Jatharagni* which is situated in stomach also known as digestive fire.<sup>4</sup>

**1) *Jatharagnimandya janya Ama*:** When the function of *jatharagni* is impaired, the ingested food is not digested properly and *Ama* Produced. This *ama* is divided into four types viz. *Anaarasa rupa ama*, *Adyaaharadhatu rupa ama*, *Rasashesa rupa ama* and *Malasanchaya rupa ama*.<sup>5</sup>

**i) *Annarasa rupa Ama*:** If the function of *Agni* is not proper, the food will not be digested properly and this undigested or improperly digested food undergoes the process of fermentation and act like poison for the body. As a result this fermented *annarasa* when comes out from upper passage is called *chhardi* and if from lower passage known as *atisara* and the combined condition is known as *visuchika*. In this the disease is produced in *mahaastrotas* and is produce due to local irritation of gastric mucosa.

**ii) *Adyaaharadhatu rupa Ama*:** When the food is digested improperly and the outcome of this improperly digested food is absorbed, it is known as *adyaaharadhatu rupa Ama*. This absorbed *Ama* then circulates in *rasavahastrotas*. If it is metabolised by *rasagni* it get cured and if not it leads to the *mandyata* of *rasagni*. This is seen in the *samprapti* of *Jwara*.

**iii) *Rasashesa rupa Ama*:** Due to excessive intake of food or hypo function of *Agni*, food is not digested completely (in terms of quantity, not quality). This remaining food is termed as *rasashesa rupa Ama*. This leads to the *samprapti* of *rasashesa ajirna*. It is a local condition and at this stage its treatment is also simple.

**iv) Malasanchaya rupa Ama:** The action of *jatharagni* is the division of *Ahara* into *prasada* and *kitta* part. If *prasada* is not properly formed due to hypo function of *agni* it leads to *Annarasa rupa Ama* or *Adyaahardhatu rupa Ama*. Similarly, the *kitta* may also be not formed properly by hypo function of *agni* and become harmful to body. The *kitta* produced by normal function of *agni* has its role in normal physiology of the body. But improperly formed *kitta* or *mala* does not perform its normal physiological functions and is difficult to be thrown out of the body. This retained *mala* is then termed as *malasanchaya rupa Ama*. Which could neither be expelled out by upper passage nor by lower passage leads to the condition of *Alasaka*

These are the different types of *Ama* and the diseases produced at *jatharagnimandya* level.

**2) Bhutagni mandya janya Ama:** According to *charaka*; the digestion of food by *jatharagni* results in the breakdown of food into five distinct physico-chemical groups i.e. *panchabhutas* viz. *parthiva*, *apya*, *tejas*, *vayavya*, and *nabhasa*. *Jatharagni* ignites the *agni* fraction present in each of five groups. This *bhutagni* then converts the respective portion into assimilable form. If the function of *bhutagni* is not proper, at this stage *Ama* would be produced is called *Bhutagni mandya janya Ama*.

**3) Dhatwagni mandya janya Ama:** *Dhatwagni* are seven in number as stated by *charaka*. Envisagement of seven types of *dhatwagnis* has been done in the seven types of *dhatu*s. These perform metabolic transformation of nutrients into assimilable and removable moieties. According to *Vagbhata* the components of *pachakagni* when situated in the *dhatu*s are termed as *dhatwagnis*<sup>6</sup>. But according to *Arunadatta* when *dhatwagnis* reach alongwith *annarasa* into *dhatu*s then they are termed as *dhatwagnis*<sup>7</sup>. So it is clear from above description that the part of *agni* which is situated in the seven *dhatu*s are termed as *dhatwagnis*. The seven *dhatwagnis* are *rasagni*, *raktagni*, *mamsagni*, *medagni*, *asthyagni*, *majjagni*, and *shukragni*. The imbalance of *dhatwagni* leads to the impairment of intermediate metabolism resulting

in the production of incompletely metabolism resulting in the production of incompletely metabolised substances which are obviously not fit for utilization by *sthayi dhatu*s. Thus these products are in *Ama* state and cause *Amadosha* at this level.

So far we have considered the gross classification of 13 *agnis* explained in the classics but it is important to recall here that this is just a broad classification. As each cell has its own *agni* and at every site of body where the transformation of any metabolite is taking place, it happens because of the *Agni* present there. Therefore, *agnis* are considered infinite also. Accordingly, *Ama* might be produced at every site of transformation, if *agni* present there does not work properly. Therefore, *Ama* might also be of infinite types which are very difficult to explain individually.

#### CLINICAL SIGNIFICANCE OF AMA:

*Ama* is fairly easy to clear from the body, but once it spreads into the deeper tissue it becomes much more difficult to eliminate. As *Ama* accumulates in the body, it inevitably clogs the channels of the body and disrupts tissue nutrition.<sup>8</sup> When *Ama* finds its way into the deeper tissue, it coats and clogs individual cell membrane- inhibiting cellular communication and weakening the immune response. This can cause much serious diseases such as autoimmune disorder.

#### Signs & Symptoms of Ama<sup>9</sup>:

Generalized signs and symptoms of *Ama* as below:

*Srotorodha*: Clogging of channels

*Balabhransha*: Decrease strength of immunity, Fatigue

*Gaurav*: Heaviness in the body and head.

*Anila mudhata*: Abnormal or obstructive flow of *Vata*

*Alasya*: Lethargy

*Apakti*: Indigestion

*Nisthiva*: Excessive salivation

*Malasanga*: Obstruction of urine & stool and other waste product in the body

*Aruchi*: Lack of desire towards food.

*Klama*: Exhaustion

*Arti*: Restlessness

*Vistambha*: Constipation

*Vidaha*: Burning sensation

### Clinical features of *Ama*:

**Srotorodha**: It means clogging of channels. *Srotorodha* may involve whole body or a particular *srotas*. It can be understood as blockage in the existing route of *dosha*, *dhatu*s and *malas* etc. As *Ama* is sticky in nature due to which it has tendency to stick in the channels of *dosha*, *dhatu*s and *mala* in the body and produced symptoms accordingly. As in disease *Amavata* obstruction of *vata* due to *ama* causes stiffness in joint. Due to stickiness of *Ama* it sticks in the blood vessels and causes atherosclerosis which can inhibit the blood circulation and causes ischemia. Also *ama* causes the formation of *Ashmari* (stones)<sup>10</sup> which causes obstruction of urine due to obstruction in free flow or transport of particles in membrane and tissue resulting inhibition of secretion of fluid and enzymes. Also it hampered cell membrane permeability and transportation of nutrients and essential mineral exchanges at cellular levels.

**Balabhransha**: *Bala* means capacity to do exercise, Also *Ojas* called as *bala*.<sup>11</sup> It can be understood in both ways as first being is unable to do anything due to less power and get fatigue. Another is decrease strength of immunity. Due to clogging of channels, nutrition of *dhatu*s decrease as a result proper *dhatu*s do not form, due to this there is decrease in strength of *bala*. As a result, body immunity also decreases.

**Gaurav**: It means heaviness in the body or any part of body. It may be due to excess storage of *Ama* with its *Guru guna*. When *ama rasa* remains in circulation, causes less oxidation, less physical activity, which slows down the function of organs, leading to feeling of heaviness in the body. It may be due to *mandagni* of *dhatu*s and decrease in *jatharagni* during *ama* condition.

**Anila mudhata**: Abnormal or obstructive flow of *Vata* inside the channels or it can be interpreted as sluggishness of function of *vata*. Due to obstruction

of *vata* by *Ama* the function of *vata* get hampered and it cause painful condition in the disease. When *vata* gets obstructed by *Ama* causes stiffness in the joint.

**Alasya & Klama**: it means lack of enthusiasm to do work in spite of having energy or lack of desire to do anything. *Ama* has tendency to vitiate *kapha* quickly due to their similarity in nature; hence patients develop *alasya* and *klama* due to abnormal *kapha*.

**Apakti**: it means indigestion. *Mandagni* causes lack of secretion of digestive enzymes. Due to diminished function of bio-digestive fire (*jatharagni*) food cannot be digested and all undigested food remains converted into *Ama*. This *ama* reduce the power of *agni* and indigestion will occur in body.

**Nisthiva**: Due to decrease in *rasadhatvagni* it produces more *rasa dhatu mala* called *dusta kapha*. This increased *dushta kapha* accumulates in *kapha sthana* like *urasthan*(lungs) causing reflex of spitting, resulting excessive sticky salivation called *kapha nisthivana*.

**Malasanga**: Obstruction of urine & stool and other waste product in the body is called *Malasanga*. There is obstruction in the passage of waste substances; abnormal accumulation of waste in the body is a sign of *Ama* in that part. In constipation stool does not move properly because of stickiness in the membrane due to *tantumaya* and *abhishyandi guna* of *Ama*.<sup>12</sup>

**Aruchi**: It is the condition in which there is lack of desire towards food. It may be due to *Ama* which causes less secretion of digestive enzymes and obstruction in channel.

### CONCEPT OF *AMA* AND FREE RADICAL THEORY:

There are some views suggesting that free radicals are pathologically correlated with *Ama*. In this regard it is said that property and manifestation of free radicals are similar to those of *Ama*. Free radicals are unstable chemicals formed in the body during normal metabolism or exposure to environmental toxins such as air, food and water pollution. Certain toxic substances like heavy metals also produce free radi-

cals. *Ama* is also said to be produced from *vishaja dravyas*. Auto-oxidation, consequent inactivation of small molecules such as reduced thiols and flavins, electron transfer etc. are few such processes. In *Ayurvedic* classics the term *Agnivikriti* is used to describe processes due to which *ama* is produced.

Free radicals help our body to generate energy and fight infection, but when we have too many free radicals they attack healthy cells causing them to age prematurely. They are unstable chemicals formed in the body and can cause degenerative changes and other diseases like cancer, myocardial infarction etc. Whenever there will be formation of *Ama* it will cause pathology and show its symptoms more or less thereby. So, this correlation puts a question mark. However free radicals are also a by-product of metabolism.

#### AMA: AS TOXINS OR ANTIBODY:

A peculiar concept in Ayurveda, *Ama* has no direct correlation in modern science and can best be equated to 'toxins'. Also the impaired *vata*, *pitta* and *kapha* when mixed with one another lead to formation *Ama dosha*. Due to inhibition of *jatharagni* if the ingested food is not properly digested and the products which arise out of such a impaired digestion are being retained in stomach they undergo changes and yield toxic substance i.e. *Ama*. This may very well be compared with toxemia of different types.

Second type of *Ama* in this category is the *Ama* produced by ingestion of poisonous substance and produced due to external factors. Even the endotoxins produced due to external factors. Even the endotoxins produced by some parasites, bacteria etc. could be termed as *Ama*. Therefore, *Ama* can be classified in different ways; as *Ama* is not a single entity but is a generalised term that can be applied to any substance

Ayurveda suggests that the immune system attacks the body's own cells do not accidentally, but it does to defend against a form of harmful metabolites body, called '*Ama*'.<sup>13</sup> *Ama* is produced in the tissues that are attacked. There are several reasons for the

emergence of *Ama*. Disorders caused by *Ama* lies in the property of the *Ama* that it takes out on various cells of the body, and deep within the biological systems calls. Autoimmune diseases are usually caused by large amounts of *Ama* penetrate certain body tissues or physiological systems. It may block or destroy the various receptors in body.

## CONCLUSION

The concept of *Ama* and free radical theory has already been dealt separately. After studying *Ama* it becomes clear that *Ama* is not a single entity but is a generalised term that can be applied to many malformed substances in the body. This *ama* is responsible for the production of various diseases. Similarly free radicals have also been implicated as the root cause of diseases. Free radical theory is one of the biggest clues, which help us in understanding the phenomena involved at the molecular level of *Ama*. Though free radicals may be regarded under category of *Ama*, but *ama* comprises within itself a group of many such other harmful biochemical entities also, of which free radicals are just a part, i.e. *Ama* refers to a group of unwanted and malformed substances in the body and free radicals are among them. The *Ama* and antibody then interacts each other to form an immune complex, which is deadly combination. It gets deposited in tissue and produce symptoms of *Amavata*.

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