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Review of *Bhootagnipaka* w.s.r. Modern Physiology

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ABSTRACT

Ancient scholars of Ayurveda have wonderfully explained various metabolic events undergoing at different levels inside a human body through functions of several types of Agni. There are 13 types of Agni, functioning normally at different levels and thus maintaining the health of an individual, while on becoming suppressed or vitiated leads to death of the individual. In modern era, these *Agnis* are often compared with the enzymes and biochemical substances which take part in biological and/or biophysical transformations and reactions. Since *Mandagni* is told as the causative factors for all the diseases, present article attempts to establish a better understanding between *bhootagni* with special reference to modern physiology, which will definitely support the system of ayurvedic sciences in prevention and cure of all diseases.

KEYWORDS

Agni, Pachak pitta, Dhatu, Kayagni, Dhatwagni paka, Bhutagni



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INTRODUCTION

● AYURVEDIC VIEW

Pitta and *Agni* show very close association with respect to their actions like *paka*, or *pacana* or *parinaman* etc. The process of digestion, metabolism and assimilation is mainly accomplished by *Agni*. The term *Agni* comprehends various factors which perform and direct the course of digestion and metabolism, in living organism, converting *pakadi karmas* or bio-physio-chemical processes in the consumed food not only into its various structural and functional constituents but also to provide the energy necessary for proceeding with its innumerable vital activities.

The objective of *Ayurveda* science is to sustain the health of the healthy and cure disease of diseased¹. In *Ayurveda* health is a specific condition where *dosha*, *Agni*, *dhatu*, *malas* (waste products), and all physiological functions should be in homeostatic state and soul, sense organ and mind should be in a state of total wellbeing². According to *Caraka Samhita*, the no. of *Agnis* mentioned are 13. *Antaragni/jatharagni/pachakagni* = 1

Bhutagni = 5

Dhatwagni = 7.³

Susuruta has described only 5 *Agnis* i.e., *Pacakagni*, *Ranjakagni*, *Sadhakagni*, *Alochakagni* and *Bhrajakagni*. But

indirectly, *Susuruta* also told 5 *Bhutagni*, thus concluding total 10 types of *Agni*.⁴

Vagbhata on the other hand, has described 5 types of *pittas*, 5 *Bhutagni*, 7 *Dhatwagni*, 3 *Doshagni*, 3 *Malagni* = 23 *Agnis*.⁵

Sharangdhara accepted five *Agnis* only⁶ and *Bhavamishra* is seen to have followed *Caraka* and *Vagbhat*⁷

Prana vayu helps in ingestion of food. Ingested food disintegrates because of the liquids or unctuous substances present in the form of *kledaka kapha*. The *samana vata*, that has an inbuilt ability to ignite the *Agni*, stimulate the digestive enzymes and adequately digests the food that one consumes timely and in an appropriate quantity thus leading to longevity. This process of digestion by *agni* in the gut which leads to the formation of *Ahara rasa* and *Mala* is comparable to the process of cooking of the raw rice kept in an earthen vessel containing water on a fire.⁸

Caraka has referred *Bhutagni* in the context of normal digestive process. According to *Cakrapani*⁹, digestion of food by *Jatharagni* leads to [breakdown] *Sanghatbheda* – of the former in five distinct physio-chemical groups i.e., *Parthiva*, *Apya*, *Agneya*, *Vayavya* and *Nabhasa*. The *agni moiety* present in substances belonging to each group is, then, stated to digest the substance of that group, leading to [a radical change in their



qualities] *Vilakshanguna*. Thus, food substances are rendered fit for being assimilated into and built up as parts of the corresponding bhuta [basis element] class of substances present in the Dhatus.

This process of assimilation is stated to be mediated by *Dhatwagnis*, present in each species of *Dhatus*. These three Agnis (Jatharagni, Bhutagni and Dhatwagni) play a major role in maintaining consistency of homeostasis so called every disease born due to disequilibrium of *Agni*.¹⁰

PROCESS OF DIGESTION

The alimentary tract provides a continuous supply of water, electrolytes, vitamins and nutrients that requires:

- *Prana vata* enables ingestion of food to the esophagus and *Samana vata* the peristaltic movement in alimentary tract.
- Release of digestive juices and digestion of food that can be compared with the karma of *Samana vayu* which ignites the action of *Jathragni* and *Pachak pitta*.
- Absorption of water, different electrolytes, vitamins and digestive products which can be compared with the *vivechan* [breakdown] karma of *Samana vata*.
- Circulation of blood through the gastrointestinal organs to carry away the absorbed substances, this process is aided by the action of *Vyana vayu* which takes the

Ahara rasa to the heart and leading to the systemic circulation.

The process of excretion of waste product out of the body is facilitated by *Apana Vayu*.

'*Agni-vyapara*' operating at the level of *Pancamahabhutas* is comparable to molecular metabolism, it is believed that hypo functioning of *Bhutagni* i.e., working at finer tissue level, might results into metabolic errors such as concept of free radicals and allied phenomena and production of such incompatible products (*aama*), which should be identified at the most subtle and paranormal levels of life processes.

• MODERN VIEW:

The GI tract provides the body with a regular supply of water, electrolytes, vitamins, and nutrients, which requires (1) movement of food through the GI tract; (2) Release of digestive juices and digestion of the food; (3) Absorption of water, different electrolytes, vitamins, and digestive products; (4) circulation of blood through the organs to carry away the absorbed substances; and (5) control of all these functions via local, nervous, and hormonal systems.

Liver is the largest organ in the body, contributing about 2% of the total body wt. or about 1.5 kg in the average adult human



.The basic functional unit of liver is the liver lobule.

It is essentially concerned with Carbohydrate, lipid and protein metabolism. Carbohydrate metabolism involves conversion of glucose to glycogen, gluconeogenesis, and resynthesize fatty acids for being deposited in the adipose tissue. As the part of Dhatwagnipaka, also liver resynthesize cholesterol and esters from lipids.

During protein metabolism, the liver fabricates non-essential amino acids, by employing nitrogen, either from other amino acids or from ammonia .It is in the liver that the final steps of nitrogen metabolism occur, with the formation of urea and uric acid in man. Liver also fabricates a number of plasma proteins and a major part of globulins.¹¹

FUNCTIONS OF LIVER¹²

1. Functions as a reservoir of blood
 2. Blood cleansing function
 3. Metabolic functions
 4. Secretion of bile
 5. Storage functions
 6. Role in blood coagulation
 7. Catabolic and excretory functions
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DISCUSSION

The wide range of natural intracellular antioxidant mechanism involving several enzymes and

chemicals like superoxide dismutase, catalase, glutathione peroxides etc. , operating at molecular level appears to be

understood in Ayurveda under ‘Bhutagni – vyapara’ , the deficiency of which will lead to increased generation of free Radicals and consequent morbidity, which is the foremost consideration in deciding the genesis of various diseases , as conceived in Ayurveda¹³

Human body is made up of five primordial elements .For its growth and development, it naturally needs nutrition having all those elements. Bhutagni present in GI tract as well as the level of tissues in respective channels , required for the third stage of digestion which brings about the formation of special nutrients for sense organs i.e, Five Bhutagni exist for taking the five elemental portions of the digested food mass and converting them into nutritive substances for five sense organs . Some of these specialized materials are the rods and cones responsible for photosensitivity in the eyes, special liquids around the taste buds on the tongue , the mucus membrane inside the nose that aids in smelling , and special cartilage forming the structure of ear . Such substances specific to each sense organ are prepared by the bhutagnis.

The digestion occur due to bhutagni doesn't alter the type of element, but it changes the structure from nirindriya to sendriya and thus makes the food useful for body .This is formed by the principle of pakajotpati in ayurveda¹⁴



Dravyas[Any Substance or matter] are either *tulya* (homologous ,similar or identical) or *vishishta* (non-homologous , dissimilar or non-identical) , which cause an increase or decrease of the dhatus due to properties potentially inherited by them .Homologous properties of dravya cause sufficient and rapid increase of an identical or homologous properties in the dhatus .¹⁵

Vagbhata has posited the view that nutrient substances derived from outside the body should be *tulya* or homologous to the dhatus. *tulya* or *samanya*, as in ,*dravya samanya* , *guna samanya* or *karma samanya* .Either of this *samanya* will promote the growth of dhatu i.e, leads to *Dhatuvridhhi* .Acc to Caraka , the *sharira dhatus* are caused to grow by the repeated use of substances possessing predominantly , homologous properties .

Caraka has referred *bhutagni* in the context of the process of normal digestive events . the digestion of food by *jatharagni* leads to the breakdown – *sanghatbheda* –of the former into five distinct physio-chemical groups i.e, *parthiva* ,*apya*, *agenya* , *vayavya* and *nabhasa* . The *agni moiety* present in substances belonging to each group , is then stated to digest the substances of that group ,, leading to a radical change in their qualities – *vilakshanaguna* (*Cakrapani*) .¹⁶

Rasadi are the seven *sthayi dhatus* (formed dhatus already present in the body) and *poshya dhatus* (the *sharira dhatus* which are to be nourished).the end products of *bhutagni paka* are known as *poshaka dravyas* i.e, *parthivadi poshaka dravyas* . *Dhatavagnipaka* is stated to metabolise the products of *bhutagnipaka* .¹⁷

Even so, it seems that *dhatwagnipaka* is considered to take place for the most part in liver same as *bhutagnipaka* .The final synthesis metabolism of *asthayi* (to be nourished) dhatus into *sthayi dhatus*, obviously take place in the dhatus themselves¹⁸

According to Ayurveda , the *gunas* potentially present in *aharadravyas* are activated by *jatharagnipaka* and actualized by *bhutagnipaka* in the final stage of digestive process, in the *adho - amashaya – pittashaya* or *pachyamanashaya* (*Cakrapani*) before *aharadravyas* being utilized in *dhatupaka* .In Caraka opinion, all these events including the absorption (*soshana*) of the *sarabhaga* (*chyle*) takes place in *amashaya* itself .

Cakrapani characterize the outcome of *bhootagnipaka* as *vilakshan gunas* , that can apply only to a complete change-over of the qualities of *aharadravyas* ingested which do not take place in the *adho amashaya*. Such a change , involving the



transformation of the products of *jatharagnipaka* take place in *yakrit* .

Jatharagnipaka results only in the breakdown of complex substances into their elemental forms which is still *vijatiya* in nature. *Bhutagnipaka* is required to process and convert them suitably as pre homologues of substances which compose the seven *dhatu*s so that assimilation of the

nutrients , being homologous to body become very easier.

Bhutagnipaka take place in *yakrit* and *jatharagnipaka* in the *adho amashaya*. As some of the important post digestive functions and metabolic events, *Yakrit* or liver is immediately concerned with carbohydrate, lipid and protein metabolism.

Food Intake
[under action of *jatharagni*]
Formation Of Chyme
[under action of *bhootagni*]
Conversion to basic homologous Simpler forms.
For Eg, ingested Carbohydrates
Converted to polysaccharide then monosaccharide.
Glucose like simpler bodily components get absorbed for nourishment under action of *Dhatwagni*.

Food Intake
[under action of *jatharagni*]
Formation Of Ahara Rasa
[under action of *bhootagni*]
Conversion to basic homologous Simpler forms.[*Pancabhaoutika* components]
Here, *Dhatwagni* comes to action ,
Leading to formation of Prasad bhaga(poshaka for *rakta* formation & poshya for *sthayi rasa* dhatu) and kitta bhaga .

CONCLUSION

Wholesome *aharadravyas* ingested in fourfold manner, primarily been digested by *Antaragni*, is followed by further paka via *Bhutagnis* [which itself been ignited by the *Jatharagni*] and *Dhatwagnis*. Subject to the condition that *Dhatusma*, *Dhatwagnis*, *Dhatusrotmasi* and *Maruta* are not impaired, *Dhatupaka* is proceeded .The *Dhatwaharas* [nourishment for bodily tissues] thus prepared benefits the organism, strength, complexion, happiness, longevity and furnish energy to the *dhatu*.



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