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Maharshi Charaka Ayurveda
Agni a Biotransformer

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ABSTRACT

The concept of Agni is one of the most important contributions of Ayurveda to health care system. In Ayurveda, Agni has a significant role to maintain body homeostasis, body functioning, digestion and metabolism. Countless alterations happen in the body every second in the form of biochemical, biophysical, or other types of biotransformation. The entire spectrum of the body’s metabolic and digestive processes is managed by the Agni. According to function and site of action, Agni is divided into three types i.e. 1 Jatharagni, 5 Bhutagni and 7 Dhatwagni. Jatharagni is chief among all types of Agni’s because functions of Bhutagni and Dhatwagni depend on this. Jatharagni plays a key role in digestion of food-stuffs composed of the five basic elements and transforms it for utilization by the respective tissues. By this article an attempt has been made to describe the concepts of Agni in Ayurveda and its modern interpretations.

Key words: Agni, Jatharagni, Bhutagni, Dhatwagni, Biotransformation, Digestion, Metabolism.

INTRODUCTION

The Sanskrit word ‘Agni’ means ‘Fire’. According to Darshana, all things in the universe are made from Pancho-mahabhutas. Agni is one of the Mahabhuta out of them. Agni is the term given in Ayurveda for the whole process of energy liberation through digestion at the level of G.I.T and metabolism at the level of tissues.

Agni converts food in the form of energy, which is responsible for all the vital functions of our body.¹ The term metabolism is used to refer all the chemical and energy transformations that occur in the body, which is nothing but the function of Agni.

Agni in various Literatures

In Brahmasutra, Agni has been meant to be a sign of life in the body.

In Shabdakalpadruma, 61 synonyms of Agni have been compiled. These synonyms help in explaining the nature and functions of the Agni, e.g., Vaishvanara, Sarva Paka, Tanoonpata, Amivachatana, Damunasa, Shuchi, Vishwambhar, Rudra etc.²

Nyaya & Vaisesika Darshana divided Agni into following categories- Bhuama or the physical fire, Divya or the celestial fire like the lightening, rays of sun, moon, and the stars, Audarya or the abdominal fire which is responsible for the digestion as well as metabolism and Akaraja which is present in the metals...
such as gold and silver. It has been shown here that the matter and energy are separable only up to a certain level beyond which they are interchangeable and inseparable from each other.

*Acharya Charak* mentioned that after cessation of the function of *Agni*, the individual dies and when the *Agni* of an individual is *Sama*, then that person would be absolutely healthy and would lead a long, happy, healthy life. If *Agni* of a person is disturbed either vitiated or diminished, the whole metabolism of the body would be disturbed, resulting in ill health and diseased state. That's why, *Agni* is said to be the *Moola* of life. \[3\]

According to *Acharya Sushruta*, there is no other form of *Agni* in the body except the *Pitta*, and when this *Pitta* dosha is vitiated or diminished the digestion of the food material is affected the same way as the combustion of fuel is affected with diminished or vitiated fire in the outer world and both the conditions are tackled in a similar manner. \[4\]

*Chakrapani* has commented on *Pittantargatta*, that the function of *Pitta* inside the body is not combustion but its work is to provide heat energy of *Agni*. \[5\]

*Pitta* is of five divisions, which is located in the middle of the *Pakvashaya* and *Amashaya*, although it is composed of *Panchabhutas*, because of the predominance qualities of *Tejabhuta*, it is devoid of liquidity. Also, because it does not possess *Snigdha*, *Sita* and such other properties of *Apbhuta*, it is called by the term *Anala*. Because of its function of *Paka* it cooks the food, dividing it into *Prasada* and *Kitta Bhaga*. The *Jatharagni* bestows grace to the other *Pitta* in the body and to the *Dhatvagni* present in the *Dhatus*. \[6\] (As.Hr.Su.12/10-12)

In the text *Bhagovat Geeta* it is mentioned that the Lord Krishna says that he lives in *Deha* in the form of *Agni*. \[7\]

**MATERIALS AND METHODS**

All contents and references regarding *Agni* and *Pitta* are collected from *Brihattrayi, Laghuttrayi*, textbooks of *Ayurveda, Kriya Sharir* as well as modern physiology and relevant matter described on journals and websites.

### Types of Agni

#### Table 1: Types of Agni according to different Acharyas.

<table>
<thead>
<tr>
<th>Acharya Charaka[8]</th>
<th>Acharya Vagbhata[9]</th>
<th>Acharya Sushruta/Sharangadhara</th>
<th>Acharya Bhavamishra[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jatharagni – 1</td>
<td>Bhutagni – 5</td>
<td>Pachakagni</td>
<td>Explained same as Acharya Charaka and Vagbhata</td>
</tr>
<tr>
<td>Bhutagni – 5</td>
<td>Dhatvagnis – 7</td>
<td>Ranjakagni</td>
<td></td>
</tr>
<tr>
<td>Dhatwagni – 7</td>
<td>Dhoshagni – 3</td>
<td>Sadhakagni</td>
<td></td>
</tr>
<tr>
<td>Malagni – 3</td>
<td>Alochakagni</td>
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<tr>
<td></td>
<td></td>
<td>Bhrajakagni</td>
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</tr>
</tbody>
</table>

#### Similarities of Agni and Pitta

Both perform similar function like *Dahana*, *Pachana*, *Abhipravatana* of food.

Both of these in *Vriddhi Avastha*, responses to *Sheeta Kriya*.

According to *Maricha*, *Agni* present in the *Pitta* gives good or bad results when it is in normal or vitiated. \[12\]

*Ushma* is considering as the function of normal *Pitta* and *Agni* in the body.

*Acharya Sushruta* describes 5 types of *Agni* as variety of *Pitta*.

According to *Bhoja*, *Pitta* as *Agni*, digestive fire is included within *Agni*, which is meant for enzymatic activities of the body. \[13\]

#### Dissimilarities of Agni and Pitta

#### Table 2: Explained about difference between Agni and Pitta.

<table>
<thead>
<tr>
<th>Dissimilarities</th>
<th>Agni</th>
<th>Pitta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>No</td>
<td><em>Nila</em> (Ama), <em>Peeta</em> (Niramaya)[14]</td>
</tr>
<tr>
<td>Taste</td>
<td>No</td>
<td><em>Katu</em></td>
</tr>
<tr>
<td>Smell</td>
<td>No</td>
<td><em>Puti</em>, <em>Visragandri</em>[14]</td>
</tr>
</tbody>
</table>
Consistency | Shuska | Drava |
---|---|---|
Guna | Ruksha | Snigdha\(^{[15]}\) |
Intake of Ghrita | Agni Deepana | Pitta Shamana\(^{[16]}\) |
Panchamahabhuta | Agni Mahabhuta | Agni and Jala Mahabuta |
Gati | Urdva | Adho\(^{[17]}\) |

**DISCUSSION**

Jhataragni is the Agni present in the Jathara. According to Ashtanga Hridaya, Jatharagni, the seat is Grahani, so called because it withholds the food for a certain time inside the Amasaya to facilitate digestion. Jatharagni Paka is described as Avasthapaka in Ayurveda. Avasthapaka is the change in the state of food substance in the Amashaya and Pakwasaya in course of digestive process. Due to action of Agni, Aharapaka starts and food is transformed through three Avasthapaka.

1. Madhura Avasthapaka
2. Amla Avasthapaka
3. Katu Avasthapaka

1. **Madhura Avasthapaka\(^{[18]}\) (Digestion in Upper GIT)**

First stage of digestion is called Madhura Avasthapaka. During this stage, there occurs the release of froth like Kapha. Madhura means sweet. Carbohydrate splitting salivary amylase is the first enzyme attacking the food in GIT. So, it is called as Madhura Avasthapaka. Salivary juice and mucous secreted in the stomach serve many protective functions. These are therefore to be included under froth like Kapha. This Kapha is Malarupi in nature.\(^{[19]}\)

**Table 3: Madhura Avasthapaka and its Modern interpretations.**

| Madhura Avasthapaka | Digestion in oral cavity and fundus of stomach\(^{[20]}\) |
---|---|
In Mukha, Kapha is mixed with food. | In oral cavity, Saliva is mixed with the food |
In Amashaya, Kapha is mixed with food. | In stomach, mucine is mixed with food. |

Rasa of Ahara becomes Madhura

Digestion of carbohydrates starts due to salivary amylase. End products formed are glucose and maltose which are sweet in nature.

Kapha is formed during Madhura Avasthapaka.

Symptoms like diziness, lethargy, heaviness in stomach are seen which are similar as symptoms of Kapha.

2. **Amla Avasthapaka\(^{[21]}\) (Digestion in Stomach and Small Intestine)**

The second stage of digestion is called Amla Avasthapaka. The Pitta present in between stomach and large intestine is called Pachaka Pitta. Though made up of five basic elements, it is dominant in Agni Mahabhuta. So, it is devoid of liquidity and is called Anala. This digests the food and splits it into essential nutrient part called Sara and waste part called Kitta. This Pachaka Pitta is directly responsible for digestion and therefore, should include all amylolytic, proteolytic, lipolytic enzymes and bile salts secreted from different parts of gut and pancreas. The ingested food, undergoing digestion attains acidic nature. During this phase, the bile juice and pancreatic juices are secreted into the duodenum. The bile is liquid in nature and it is the Malarupi Pitta, also called Accha Pitta. This is the Mala of Rakta. Bilirubin is a derivative of hemoglobin metabolism and represents this Accha Pitta. It is called Amla Avasthapaka because proteolytic and lipolytic enzymes act here along with amylolytic.\(^{[22]}\)

**Table 4: Amla Avasthapaka and its Modern interpretations.**

| Amla Avasthapaka | Digestion in pylorus in stomach and small intestine\(^{[23]}\) |
---|---|
In Amashaya, Pachaka Pitta helps in the digestion of Ahara. | In pyloric end of stomach, HCl is mixed with food. |
Rasa of Ahara becomes Amla. | Due to HCl food becomes acidic and sour. |
Accha Pitta is formed during Amla Avasthapaka | Bilirubin is a derivative of hemoglobin metabolism and represents this Accha Pitta. |
Factors Influencing digestion

1. **Ushma:** “Ushma Pachati”\(^\text{[24]}\)

PH as well as basic temperature is required for proper activation and functioning of enzymes.

Ex: Gastric juice is highly acidic with PH of 0.9 to 1.2 due to presence of HCL.\(^\text{[25]}\)

2. **Vayu:** “Vayurapakarsheti”\(^\text{[24]}\)

Vata stimulates Agni to digest the food. Autonomic nervous system is involved in the regulation of salivary juices and it helps in the process of deglutition, Movements of GIT, Nervous stimulation of digestive juices.

Ex: Myenteric plexus helps in control of motility of gut. Meissner’s plexus controls the secretory activity and blood flow to the gut.\(^\text{[25]}\)

3. **Kleda:** “Kleda Shaithilyam Apadayati”\(^\text{[24]}\)

Kledaka Kapha helps in the moistening of the food. The mucous which is present in the intestine helps in softing of food.\(^\text{[25]}\)

4. **Sneha:** “Sneham mardavam janayati”\(^\text{[24]}\)

Bile salts help in the absorption of digested fats from the intestine into blood and helps in the emulsification of fats for proper absorption.\(^\text{[25]}\)

5. **Kala:** “Kala Paryaptamahvinivartayati”

“Kale Pakvam Samam Samyak Pachatyayurvedvivardhaye”\(^\text{[24]}\)

There is a specific transit time of chyme in all parts of GIT.

6. **Samayoga:** Sama means proper, Yoga means collection.

Proper collection or wholesomeness of food.

3. **Katu Avasthapaka:**\(^\text{[26]}\) (Digestion in Large Intestine)

Last stage of digestion is called Katu Avasthapaka. Here absorption of water and electrolytes takes place. At this stage, Anna undergoes Shoshana Karma by Agni and obtains its Paripindita form. Due to the activity of bacterial flora, some pungent gases like methane and ammonia releases here, this represent Katu nature of Vata.\(^\text{[27]}\)

<table>
<thead>
<tr>
<th>Table 5: Katu Avasthapaka and its Modern interpretations.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Katu Avasthapaka</strong></td>
</tr>
<tr>
<td>In this phase, after absorption of water other nutrients, Ahara becomes dry and Katu.</td>
</tr>
<tr>
<td>Vata Dosh is formed during Katu Avasthapaka</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 6: Avasthapaka in brief</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avasthapaka</strong></td>
</tr>
<tr>
<td>Madhura</td>
</tr>
<tr>
<td>Amla</td>
</tr>
<tr>
<td>Katu</td>
</tr>
</tbody>
</table>

**Bhutagni:** The five Bhutagnis digest their own part of the element present in the food materials. There are five types of Agni namely, Parthivagni, Apyagni, Agneyagni, Vayuvyagni and Akashagni.\(^\text{[28]}\) Each and every cell in our body is composed of five Mahabhutas. Naturally each cell consists of these Bhutagni also. The five Bhutagnis digest their own part of the element present in the food materials. Broken down and partially digested food is again exposed to Bhutagni. In case of food, Jatharagni digests the food and Bhutagni functions for releasing qualities of food. The function of Bhutagni is to metabolize the ingredients of food and sort them out into 5 groups depending on the predominance of particular Panchamahabhuta.

**For example:** Glucose is converted into glucose 6 phosphate and stored in the form of glycogen. Amino acids are converted into pyruvate and with the help of gluconeogenesis it converted into glucose. Therefore,
releasing of their Guna/qualities in the food can be correlated to Bhutagni.

The process of Bhutagni Paka should start immediately after digestive process in GIT. Hence Bhutagni function starts immediately after absorption i.e. portal circulation to the liver ends before assimilation by delivering Ashayi Dhatwamsha into the circulation through hepatic vein. So, the Bhutagni functions are carried in the portal system, liver and vascular system through which Ahara Rasa is circulated in the body for nourishing the Rasadi Sapta Dhatus. Hence liver is considered as centre of Bhutagni Vyapara. According to the physiology of Ayurveda, Bhutagni Paka follows Jatharagni Paka and it completes the process of intestinal digestion. After completion of Bhutagni Paka only, the formation of Ahara Rasa is completed and Rasa absorption is possible.

Dhatwagni: It is used for the formation of Dhatu Utapathi Karma. Seven Dhatavah contains their own Agni and responsible for conversion of food into Prasada Bhaga and Kitta Bhaga. Metabolism at tissue level is dependent on these Dhatwagnis.

For example: Amino acids cannot cross the muscle cell membrane in the absence of certain hormones like Insulin, GH, Testosterone and Thyroxin. So, all these hemocrine hormones can be included under Dhatwagnis. Further, once inside the cell, amino acids can be either used for protein synthesis or they may be catabolized for the purpose of energy. If they are catabolized, there will be either formation of Acetyl Co A or some other intermediate compounds of Krebs or TCA cycle and during Krebs cycle, there will be formation of energy as well as wastes like CO$_2$ and H$_2$O.

**Action of Panchamahabhuta on Dhatu**

Here respective Panchamahabhutas nourishes the respective Dhatus.

### Table 7: Correlation between Dhatus and Panchamahabhutas.\[^{[31]}\]

<table>
<thead>
<tr>
<th>Panchamahabhuta</th>
<th>Dhatus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jala</td>
<td>Rasa</td>
</tr>
<tr>
<td>Teja and Jala</td>
<td>Raktha</td>
</tr>
</tbody>
</table>

Example: Asthi Dhatu is mainly formed by Pruthvi Mahabuta, however much we eat Partheeva Dravyas in food, if Parthivagni and Asthidhatwagni of Asthi Dhatu fail to utilize the Poshakamshas like Ca and P of the Ahara Rasa, the Asthi Dhatu cannot grow at all.\[^{[32]}\]

**Types of Agni according to Susrutha**

Pachakagni:\[^{[33]}\] Pitta that is found localized in between Pakvasaya and Amasaya, helps in digestion of four kinds of food, separate the Doshas, Rasa, Mutra and Purisha, and it helps the other sites of Pitta elsewhere in the body by bestowing properties of fire, this Pitta is known as Pacakagni. It can be correlated to Enzymes and hormones secreted from stomach, small intestine (succus entericus), pancreas (pancreatic juice) and bile. Ultimately it is responsible for digestion of ingested food by the process of hydrolysis and their chemical and metabolic transformation.

Ranjakagni:\[^{[33]}\] The Pitta found in the Yakrut and Pleeha is known as Ranjakagni, and which gives color to the Rakta. Ranjakagni can be correlated to Erythropoietin, Growth inducers, Norepinephrine, Epinephrine, Androgen hormones

Sadhakagni:\[^{[33]}\] The Pitta present in the Hridaya is known as Sadhakagni, it is responsible for fulfilling the desires of the mind.

Hridaya –HR= Harana = Receiving
DA = Dana = Giving
YA = Yayati = Place of exchange

So here we can consider Brain as the Sthana.

All the functions of Neuropeptides and Neuro transmitters like Nor epinephrine, Dopamine, Serotonin, Nitric oxide may be represented as Sadhakagni.
**Alochakagni**: The *Pitta* present in the *Drstī* is known as *Alochakagni*, it is responsible for perception of vision. Photo receptor cells of retina especially Rods and Cones. The activated rhodopsin and iodopsin present in rods and cones, following exposure to light triggers photo transduction which results in generation of receptor potential in photo receptors. Then the light energy is converted into electrical energy.

**Bhrājakagni**: The *Pitta* present in the *Twak* is known as *Bhrājakagni*, it is responsible for digestion and absorption of substances used in the form of *Abhyanga, Parisheka, Avagaha, Lepa* etc. and helps expression of shades and colour on the skin.

Melanocytes present in skin [melanocytes synthesize melanin from amino acid tyrosine in the presence of enzyme called tyrosinase in the melanosome]. Melanocyte Stimulating Hormone secreted from medial lobe of pituitary regulates the Melanin production from the melanocytes located in the epidermis of skin.

**CONCLUSION**

All the functions of the body like segregation, digestion, absorption, assimilation, conversion of food into body elements, elimination of toxins and waste from the body is performed by the *Agni*. *Jatharagni* can be correlated to the hormones and enzymes in the whole process of digestion in the G.I.T. *Bhutagni* activity may be carried out in the portal system, liver and vascular system. *Dhatwagni* mediate or catalyze further metabolic transformation of the nutrient substances. This is an attempt to explore the concept **of *Agni* in *Ayurveda***. Much more research is yet needed to define **Bhutagni** and **Dhatwagni** at physiological, clinical and therapeutic level.

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