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## Physiological Importance of *Pachakpitta* in *Aaharpaka* (Digestion) in Modern Perspective

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### ABSTRACT:

The *tridosha* theory drives *Ayurveda* science. *Pitta* is one of the three *doshas* and is responsible for digestion and metabolism. There are five forms of *Pittadosha*: *Pachaka*, *Ranjaka*, *Alochaka*, *Bhrajaka*, And *Sadhakapitta*. *Pachakapitta* is in charge of food digestion, *Sara* and *Kitta Vibhajan*, and nourishing the *Agneya* component of *Pitta* in various sections of the body. *Jatharagni* is another name for it. *Pitta'sagni* aids digestion and then separates the *Sara* and *Kittabhaga*. Because of its location, it nourishes and strengthens *Pitta*. *PachakaPitta* is to blame for *AaharPachan*, as our book clearly demonstrates. On the other hand, current or contemporary science has proven via several research those distinct digestive fluids are responsible for food digestion. All enzymes involved in digestion, such as amylolytic, proteolytic, and lipolytic enzymes, can be compared to *pachakapitta*, as its activities suggest. Only a few works on *pitta's* conceptual elements have been mentioned. The importance of *pachakpitta* in food digestion is discussed in this article. The core resources for this study were gathered from *Ayurvedic* classics with available commentaries, as well as modern medical science textbooks to gain a better grasp of the concept and its usefulness in digestion.

**Keywords-** *Pachak pitta*, *Agni*, Digestion, Digestive enzymes

## INTRODUCTION

*Ayurveda* defines a healthy existence as one in which the humours and metabolic phase are in balance, the biological actions of the tissues and excretory products (i.e. physical stage) are in balance, and the soul, senses, and mind (i.e. mental state of the body) are in balance. The *tridosha*

concept is purely theoretical, and no single substance or structure can represent a *dosha*. *Pitta* is one of the three *doshas* and is in charge of digestion, metabolism, heat production, and other forms of energy. On the basis of location, the *pitta dosha* is split into five types: *paachak*, *ranjak*, *saadhak*, *alochaka*, and *bhrajakapitta*. When



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conducting various types of physiological functions, these entities collaborate and coordinate with one another. As a result, a proper knowledge of the functions of *pachakapitta* from a modern perspective is required. Because the roles of *Pachakapitta* vary, it cannot be represented by a single entity at all times. *Ayurveda* is a science that is built on the concept of functional understanding once again. In today's world, students, particularly those in their first year of Bachelor of *Ayurvedic* Medicine and Surgery, have a difficult time grasping the notion of *Ayurveda*. In terms of supporting current literature, there is no precise correlation of *Pachakapitta* described in *Ayurvedic* literature. To comprehend the profundity of *Ayurvedic* principles on the criterion of health, there is a greater necessity for *Ayurveda* science. We are attempting to identify anatomical structures based on their physiological roles as mentioned retrospectively under the function of *pachakapitta* in this review.

*Dosha, Dathu, Mala* together forms the basis of the body.<sup>2</sup> The balance of these entities represents the healthy state and imbalance will cause various diseases.<sup>3</sup>

In normal circumstances, each *Dosha* will execute its own functions, with each *Dosha* having its own unique place. The distinct functions performed by individual *Doshas* in various locales have been highlighted by discussing the various *Sthana* of each *Dosha*. The several forms of *Dosha*, as well as their location and function, have been discussed.<sup>4</sup>

To comprehend the physiology of *PachakaPitta*, a brief physio-anatomical comprehension of the Gastrointestinal system with relation to chemical and physical digestion is required. Following intake through the mouth, food travels through the digestive tract, where it is broken down into small absorbable elements.<sup>5</sup>

The involvement of local hormones in mechanical chemical digestion is crucial. Gastrin: Stimulates gastric glands to secrete more pepsin and hydrochloric acid in gastric juice; accelerates gastric motility; promotes gastric mucosa growth; stimulates secretion of pancreatic juice, which is rich in enzymes; stimulates islets of Langerhans in the pancreas to release pancreatic hormones Secretin inhibits gastric juice secretion; inhibits stomach motility; causes constriction of the pyloric sphincter; increases the efficacy of cholecystokinin's action on pancreatic secretion.<sup>6</sup>

Cholecystokinin: Increases the secretion of enterokinase; Inhibits gastric motility; Increases the motility of the intestine; Augments the contraction of the pyloric sphincter; Plays a vital role in satiety by suppressing

appetite; Induces pharmacological tolerance to opioids. GIP (gastric inhibitory peptide) stimulates insulin release by beta cells in the pancreas' islets of Langerhans.

When a chyme with glucose enters the small intestine, it causes insulin secretion. It's dubbed glucose-dependent insulinotropic hormone because it inhibits gastric juice secretion and gastric motility. Somatostatin inhibits the secretion of growth hormone (GH) and thyroid stimulating hormone (TSH) from the anterior pituitary; inhibits gastric secretion and motility; inhibits pancreatic juice secretion; inhibits the secretion of GI hormones like Gastrin, Cholecystokinin (CCK), Vasoactive intestinal polypeptide (VIP), and Gastric inhibitory peptide (GIP)<sup>7</sup>

### **Aharapachana And Aahararasa Formation:**

*Aaharapachana* is the work of *Agni*. By *Acharya Sushruta* and *vagbhat* site of *pachak pitta* is *pakwamashay Madhya* (between large intestine and stomach), Ancient literature describes 13 different varieties of *agni*. *Jatharagni*, *Bhutagni*, and *Dhatavagni* are these. Following the ingestion of *panchabhoutika*, *aharaagni* reacts with it, causing the *dhaatus* to form and be fed. The food consumed is transported to the *koshtha* by the *pranavata*<sup>8</sup>. The liquids cause the meal to breakdown, while the mucous substances cause the food to become soft.

*Kledakakapha* carries out this action. The *pachakagni* (digestive enzymes) are intensified by the *samanavata*, which also ensures adequate food digestion.<sup>9</sup> The location between *Pakwashaya* and *Amashaya* is the home of *PachakaPitta*. In this region various *srotas* secrete various *pachakasrava*. *GrahaniPradesh* where *AnnaPachana* occurs also called as *PittadharaKala* is stated as the main *Sthana* of *PachakaPitta*.

The process of digestion is in charge of disassembling complicated food particles into simpler ones. The digestive process starts in the mouth, but because food stays there for a shorter period of time, complete digestion does not happen. In the stomach, incomplete digestion also does not take place. The small intestine is where digestion ends. The small intestine is where the majority of food products that have been digested are absorbed. The duodenum, where the majority of digestion takes place, can be linked to the *grahani* in *Ayurveda*. The digestion of protein, carbohydrates, and fat is aided by a variety of digestive hormones and enzymes.

Chymotrypsin and trypsin create peptides from protein breakdown. Some peptides are split into individual amino acids by the enzyme carboxypolypeptidase. Amylase in pancreas produces disaccharides and a few trisaccharides

by hydrolyzing starches, glycogen, and other carbs. Pantothenic lipase fatty acids and monoglycerides are produced by hydrolyzing neutral fat. Esterase of cholesterol cholesterol esters are hydrolyzed, Phospholipase splits phospholipids into fatty acids, Amylase in saliva create maltose from starch, Maltase converting glucose from maltose. Lingual lipase creates fatty acids and diacylglycerol from milk fat triglyceride, Pepsin proteases, peptone, and polypeptides from protein stomach, lipase fatty acids and glycerol from butter's triglyceride stomach, amylase transforming starch into maltose and dextrin, Gelatinase Combining meat's collagen and gelatin to create peptides, Urase Ammonia Production from Urea.<sup>10</sup>

#### **Vibhajana Of Sara And Kitta**

It refers to the process of separating the nutrients from the waste products produced during food digestion. The digestive enzyme *pachakapitta* is started by *samanavayu* for hydrolysis. Following that, garbage and nutrients are separated. With the aid of *samanavayu*, nutrient products are absorbed, and *apanavayu* eliminates waste materials<sup>11</sup>

#### **Nourishes Various Pittasthana**

Due to its unique location (between the *Amashaya* and *Pakwashaya*) and innate strength, *PachakaPitta*, also known as *Jatharagni*, enhances the actions of other *Pitta* Sites that are Present Elsewhere in the Performance of Metabolic Functions of the Body. The digestive enzymes that aid in the breakdown of food can be compared to *pachakapitta*.

The development of *raktadhatu* is aided by the *ranjakapitta*, which is found in the *yakrit* and *pliha*. Vitamin B12, folic acid, pyridoxine, vitamin C (which aids in iron absorption), and minerals like iron and copper, which are mostly obtained from diet, are factors that control erythropoiesis and the maturation of RBCs<sup>12</sup>. Iron, folic acid, vitamin B12, and other nutrients cannot be efficiently absorbed if proper food digestion is not achieved.

*SadhakaPitta*, who resides in *Hridaya*, aids in satiating mental wants. *Ajirna* will happen if digestion isn't done properly. *Murchha*-like symptoms emerge during *ajirna*, impairing the function of *sadhakpitta*.

The *bhrajakapitta*, which is found in the *twak*, aids in the absorption and digestion of the substances used in *mardan*, *sechana*, *avagahana*, and the expression of shades in the skin. All chemical reactions are mostly caused by *pachakapitta*. *Bhrajakapitta* benefits from it for this kind

of function. *Pachakagni* are dependent on *Dhatavagni*. Other *agni* become more and less severe as a result of the *pachakagni's* deterioration. Every cell in the body receives food from *pachakapitta*, which aids in the production of nutrient products. *Bhrajakpitta* performs its job when the cell has grown properly. The lipid-containing material moves into the cell's membrane.

#### **Absorption Of Aaharasa**

It moves toward the *kostha* with the aid of *pranavayu* after ingesting *aahara*. The location of the *pachakagni* is *grahani*, also known as *pakvamashaya* or *pittadharakala*. *Amashaya'sSamanaVayu* stimulates the *pachakagni* to aid in food digestion and separation as well as *shoshayati*, or the absorption of water and nutrients<sup>13</sup>. Movement, which is the primary role of *vata*, is necessary for the absorption of nutrients and water. As a result, both *samanavata* and *pachakagi* are in charge of absorption here.

#### **Pachakagni And Pachakpitta**

Without a comparison with *Pachakapitta*, the discussion of *Pachkagni* cannot be concluded. As we see the features and functions of *Pachakagni* and *Pachakapitta*, it seems similar to each other. There is no area exist of *Pachkagni* without *Pachakapitta*, because there is increased digestion and combustion in the body due to *Ushnaguna* of *Pachakapitta*, the therapy of *Pachakagni* is also employing *Aahara&Vihara* contrary to *Pachakapitta*<sup>14</sup>

According to *Caraka*, only *Pachakagni*, which is located in *Pachakapitta*, can have positive or negative effects depending on whether it is working normally or abnormally. Since *Pitta* performs *Dahana* (burning or oxidation), *Pacana* (digestion), and other similar acts to those performed by *Re*, *Pitta* is known as *Antaragni*, according to *AcharyaSushruta*.

*AcharayaMaarich* has also underlined that when *Pachakagni* is normal, it can have a positive or negative effect on the *Pachakapitta*.<sup>15</sup>

Since *Pitta* performs re-like acts, such as *Paka*, *Pacana* (Digestion), *Dahana* (Burning), *Tapana* (Heat production), *Parinamana* (Conversion), *Paravritti* (Transformation), *Prakasana* (Illumination), *Ranjana* or *Varnakara* (Colouration), and *Prabhakara*, it has been referred to as *Agni* (re) in *Ayurveda* (to cause luster).According to *Chakrapani*, the term "*Pittantargata*" merely refers to the phenomena of heat that is connected to re, not that the *Pitta* of the body is an ingre. Inferentially, heat is believed to be related to *Pitta's* function. The Ayurvedic idea of *Agni*, which relates to the various roles assigned to *Pitta*, is all-inclusive organizations in charge of *Aaharapacana*<sup>16</sup>

The separation of the *Sarabhaga* (nutrient fraction) of the

*Ahara* from the *Kittabhaga* (the indigestible or undigested residue of the food) as well as metabolic events, energy, synthesis, and maintenance of metabolism occur in the *Kostha* (equivalent to gastro-intestinal digestion). According to *Sushruta*, *pitta*, which is situated in a region between *Amasaya* and *Pakvasaya*, is in charge of the digestion of the four types of food consumed by living things and the subsequent expulsion of the leftovers in the form of urine and faeces.

It contributes to and enhances the actions of other pitta places by being situated in its own location (between *Amasaya* and *Pakvasaya*). As a result, this pitta is referred to as "*Pachakagni*". In addition, *Pachakapitta*, also known as *Jatharagni*, *Kosthagni*, *Antaragni*, *Pachakagni*, *Dehagni*, etc., is considered to understand photo and chemo synthesis processes while being situated in its own location between *Amasaya* and *Pakvasaya*.

participates directly in food digestion while also supporting and enhancing the actions of the remaining pittas that are found elsewhere in the body.

## DISCUSSION

Basically *Vata*, *Pitta*, *Kapha* constitute three regulating systems i.e. neurological, endocrine and immunological system respectively of all biological system. All *Acharyas* refer to *pachakapitta*, one of the five forms of *pitta*, as *jatharagni*. The *grahani*-based *Pachaka Pitta* is in charge of *pachan*, *Sara Kitta Vibhajana*, and *Anugrahana* of Other *Pitta*. Digestion is mostly the responsibility of *pachakapitta*. Digestion is primarily caused by three things. *samanavayu*, *pachakapitta*, and *kledaka kapha*. *Pachakapitta* is stimulated by *samanavayu* to aid in food digestion and the separation of nutrients from trash. Food's breakdown and suppleness are aided by *kledakakapha*. After the digestion of food *Pachakagni* and *samanavayu* by *munchana* action assists in propelling chyme in their respective direction i.e., waste materials towards large intestine and *saarabhaag* is propelled towards intestinal villi. By the *soshyati* action of *agni*, *saarabhaag* is absorbed through intestinal villi and arrived the superior mesenteric vein.

It travels from the superior mesenteric vein through the liver and *samanavayu* to the heart via the portal vein and inferior vena cava. From the foregoing information, it is possible to compare the physiological functions of Trypsin, Chymotrypsin, Carboxypolypeptidase, Pancreatic Amylase, Pancreatic Lipase, Cholesterol Esterase, Phospholipase, Maltase, Pepsin, Gelatinase, and Urase to

those of *PachakaPitta* as described by *Acharyas* because *pachak pitta* has important role in the digestion of four types of food as all these digestive enzymes also helps in the same way, so we can compare these enzymes with *pachakpitta*. The generation of heat and other forms of energy during chemical reactions in our bodies is referred to as the *Pittadosha*. *Pachakapitta* plays a significant part in digestion and aids in catalysing other *pittas'* other chemical reactions or functions.

## CONCLUSION

After a thorough examination of *PachakaPitta*, it became apparent that each notion related to *PachakaPitta* had its own significance and was difficult to achieve on a single point. Before food is swallowed, the teeth chop and grind it, and then the stomach and small intestine's smooth muscles churn it. Food molecules softened and thoroughly combined with digestive enzymes as a result. The bulky lipid, protein, carbohydrate, and nucleic acid molecules in food are split into smaller molecules by hydrolysis during chemical digestion.

The functioning of digestive enzymes and gastrointestinal hormones can be connected to *Pachaka Pitta's* goals. The duodenum and *Pakvaamashaya Madhya* are the *Sthana* of *Pachaka Pitta*, respectively where even more food particles are digested. Due to the fact that all of the digestive enzymes, such as trypsin, chymotrypsin, maltase, and lactase, aid in the digesting process, *pachakpitta*, also known as *pachakagni* (digestive fire), aids in digestion.

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