



A Conceptual Review of Terms *Pittashaya*, *Agnyashaya* and *Pittadhara Kala* w.r.t Digestion and Absorption of Food

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Abstract: *Ashaya*, is the place which gives shelter to *Dosha*, *Dhatu* and *Mala*. One among the *Ashaya* is *Pittashaya* that gives shelter for *Pitta*. Though *Pittashaya* is not stated directly, it is stated in relation to *Pittadhara Kala* as present between *Amashaya* and *Pakwashaya*, and helps in digestion and absorption of food. As per *Sharangadhara*, *Agnyashaya* is the term used for *Pittashaya*, which is situated above *Nabhi* and extend towards left side, between *Amashaya* and *Pakwashaya*. *Pittadhara Kala*, is that which withholds four types of *Anna* i.e *Ashita*, *Khadita*, *Peeta* and *Leeda*, that moves gradually during the process of digestion from *Amashaya* to *Pakwashaya*. *Acharya Sushruta* states *Grahani* is situated between *Amashaya* and *Pakwashaya* but *Acharya Vagbhata* states that *Grahani* is the pathway for *Pakwashaya*. *Acharya Charaka* states the site of *Agni* as *Grahani*, as it receives and retains the food for duration of its digestion, the region where digestion takes place predominantly. There is need to understand, why there is no mention of *Pittashaya*, while *Acharya* have mentioned about *Amashaya* and *Pakwashaya*. Further, there is a term *Grahani* used to state the region, which receives *Chaturvidha Annapana* and there is mention of *Pittadhara kala*, as present between *Amashaya* and *Pakwashaya*, and has been stated as related with digestion and absorption, and seat for *Pitta*. Yet *Acharya Sharangadhara* has used the term *Agnyashaya* in place of *Pittashaya* and has stated that it is *Agni Sthana*. Hence, there is need to elaborate, these terminologies by critical review of available literature, both as per *Ayurveda* and modern parlance. The paper illustrates these terminologies and their interrelations, their involvement in digestion and adsorption of food, along with regional understanding of location, extent and function in the light of contemporary science.

IndexTerms - *Pitta*, *Pachaka Pitta*, *Pittashaya*, *Agnyashaya*, *Pittadhara Kala*, Digestion.

I. INTRODUCTION

Ashaya is the place which gives shelter to *Dosha*, *Dhatu*, *Mala* along with other components related to body like *Garbha*, *Stanya* etc¹. One among the *Ashaya* is *Pittashaya* which gives shelter for *Pitta*². *Pittashaya* is stated under *Ashaya* concept in *Sushruta Samhita*³, *Ashtanga Hridaya*⁴, *Ashtanga Sangraha*⁵. *Acharya Sharangadhara* has enlisted *Agnyashaya* in place of *Pittashaya*⁶.

Pitta Dosha: The term *Pitta* is derived from verbal root 'tap' which means to produce heat⁷. The derivation of *Pitta* has been stated as that which helps in *Pakthi* (digestion), *Ooshma* (generation of heat in the body) and *Darshana* (that which helps in vision by conversion of real image to virtual image)⁸. The qualities of *Pitta Dosha* are *Sasneha* (unctuousness), *Teekshna* (intense, deep penetrating), *Ushna* (hot), *Laghu* (Light), *Visra* (foul smelling), *Sara* (flowing), *Drava* (liquid)⁹.

Sthana of Pitta Dosha: Are mentioned as *Nabhi*, *Amashaya*, *Sweda*, *Lasika*, *Rudhira*, *Rasa*, *Druk*(sight) and *Twak*(skin) and among these, *Vishesha Sthana* is *Nabhi*¹⁰, *Amashaya*¹¹.

Effect of increase or decrease of Pitta: If there is *Vruddhi* (increase/excessive secretion) of *Pitta Dosha*, the individual suffers from symptoms like *Peetavabhasata* (yellowish discoloration of body), *Santapa*, *Sheetakamitva*, *Alpanidra*, *Balahani*, *Peetavinmutranetratvam*¹². If there is *Kshaya* (decrease/hyposecretion) of *Pitta Dosha* the *Lakshana* seen are *Mandagni*, *Mandoshmata*, *Prabha Haani*, *Nakha-Nayana Shuklata* (whitish discoloration of nails and eyes)¹³.

Pachaka Pitta is located between *Amashaya* and *Pakwashaya*, does *Pachana* of *Ahararasa* and separates the bolus into *Saara* and *Kitta Bhaga*. *Pachaka Pitta* by remaining in its original place, supports and sustains other divisions of *Pitta* located at different places in the body¹⁴.

Ranjaka Pitta is term used for *Pitta* that resides in *Amashaya* and imparts homogenous coffee ground colour (muddy red) to the *Ahara Rasa*¹⁵.

Nirukti of Pittashaya: The word *Pitta* is derived from Sanskrit 'tap' *Dhatu* and 'ach' *Pratyaya*⁷, the place where *Pitta* is produced and resides, making it as its own place and starts conducting its function in the form of process of metabolism is called *Pittashaya*.

Sthana of Pittashaya- *Pittashaya* is situated between *Pakwashaya* and *Amashaya*¹⁶.

Karya of Pittashaya- Aids in digestion and absorption by the function of *Pitta* and helps in separation of *Saara* and *Kitta Bhaga*, governed by *Vayu*, conducted in *Pittashaya*¹⁷.

Pittadhara Kala, the sixth *Kala* in order, receives four types of food like *Ashita*(chewed), *Khadita*(swallowed), *Peeta*(liquid), *Leeda*(licked), propelled from *Amashaya* up to *Pakwashaya* and helps in timely digestion and its absorption by the influence of *Tejo Shakti* of *Pitta*¹⁸.

Discussion: The lining membrane of *Pittashaya* in the form of biliary ducts of Liver, Extrahepatic biliary apparatus and predominantly Gall bladder along with association of Proximal half of midgut loop (lower half of 2nd, 3rd, 4th part of duodenum and proximal half of jejunum) and exocrine part of Pancreas can be taken as related with *Pittadhara Kala*.

Grahani is the term used for that part where the process of digestion and absorption of *Chaturvidha Anna* takes place and is synonymically used for the part of *Ashaya* that lies between *Amashaya* and *Pakwashaya* and helps in *Grahana*, *Vivechana*, *Pachana* and *Munchana* of *Ahara* and said to be the seat for *Agni* or *Drava Pitta* which is involved in the process of metabolism¹⁹.

Discussion: It is the site of *Pittadhara Kala* and *Pachaka Pitta* which helps for *Ahara Pachana*. It is the seat of *Jatharagni* which helps in beholding food and thereby ensures timely digestion. The predominant part of *Kshudrantra* or *Pachyamanashaya*, which forms seat for function of *Pachaka Pitta* can be related with the junction of foregut and midgut, where the hepato-pancreatic duct(ampulla of Vater) opens out, pouring the enzymatic secretions in the form of bilious and pancreatic secretion from liver and gall bladder along with pancreas respectively. It is the part of small intestine in the form of lower half of second part of duodenum up to proximal half of jejunum. This area is made up of all the salient features of small intestine like circular folds of mucus membrane, that do not obliterate by distension, along with intestinal villi and microvilli, that increases the surface area enormously and aid in the process of digestion and absorption of metabolized food. Thus, *Grahani* can be considered as part and partial of *Pittashaya*, lined by *Pittadhara Kala* that helps in segregation (*Vivechana*), digestion (*Pachana*) and absorption, by receiving *Pachaka Pitta* in the form of *Pitta*, that is stored in gallbladder, commonly designated as *Ashraya* for *Pitta*-the bile.

Yakrit, is one among the *Koshanga*, situated to the right and lateral side of *Hrudaya*²⁰. It is place of *Ranjaka Pitta* which imparts *Raktavarna* to the *Ahararasa*. It is the *Moolasthan* of *Raktavaha Srotas*²¹. *Yakrit* along with *Pleeha* are the *Sthana* of *Shonita*. *Shonita* stays here and nourishes all other parts of body²². *Ahara rasa* as it passes through the *Yakrit* by the influence of *Ranjaka Pitta*, gets metabolised and the fine form of *Ahararasa* enters the *Hrudaya*, which is said to be *Moolasthan* of *Pranavaha Srotas* and from *Hrudaya* enters into the *Puppusa* where *Ahararasa* passes through the influence of exchange of gases and gets converted into *Rasadhatu* that enters the Left chambers of heart for circulation to the whole body through *Dhamani*(Major vascular structures in the form of Aorta and its branches) and replenishes all cellular component of the body. As *Yakrit* is *Moolasthan* of *Raktavaha Srotas*, *Rakta* which is in the circulation contain *Pitta* (bilirubin and worn-out RBC) as *Mala*(the nitrogenous waste), when comes in association with *Yakrit* gets broken down and helps in formation of bile, which is secreted through hepatocytes of liver.

Discussion related to Yakrit as Ranjaka Pitta Sthana imparting Raktavarna to Ahararasa *Ahararasa* reaches *Yakrit* through Portal vein. The blood supply to the liver is from hepatic artery containing oxygen rich blood as it is binded to haemoglobin. Portal venous blood is red in colour as it is rich in *Ahara rasa* more than oxygen. When both portal vein and hepatic artery enters the porta hepatis of the liver, they divide and divide up to the hepatic sinusoids, where there will be admixture of hepatic arterial blood which is bright red in colour, as it is rich in oxygen with portal venous blood which is rich in *Ahararasa*, thus imparting red colour indirectly to the *Ahararasa* under the influence of *Ranjaka Pitta*.

Agnyashaya-

Nirukti-Word *Agni* is derived from root 'Agi gatau'. The place where *Agni* resides is called *Agnyashaya*²³. *Pitta* is generated in *Agnyashaya*. Infact it is the *Agni* in disguise of *Pitta*²⁴.

Sthana of Agni and Agnyashaya-

Sthana of Agni-The *Agni* which accomplishes body requirements is called *Kayagni* or *Jataragni*, that stays in *Amashaya*²⁵.

Sthana of Agnyashaya: is located above and to left of *Nabhi*²⁶. It is the term used for *Grahani*, located above *Nabhi*. *Acharya Charaka* also opines that *Grahani* is called *Agnyashaya* and is located above *Nabhi*²⁷.

Karma of Agnyashaya -*Agnyashaya* or *Grahani* which is site of *Agni*, is so called because of its power to retain [*Grahanat*] the food. It is supported and nourished by the strength of *Agni*. Retains the downward movement of partially digested food and after digestion, it releases the food through its further luminous passage. *Agnyashaya* or *Grahani* is site of *Pachaka Pitta* or *Jatharagni*, as it holds the food for certain time inside it, to facilitate digestion²⁸.

Discussion: As the classical description goes in favour of structure that is present above the point of umbilicus(*Nabhi*), and to the left, it can be associated with the organ Pancreas as *Agni Sthana*, and the exocrine part of pancreas along with major and minor pancreatic duct as *Agnyashaya*, that helps in secretion of *Dravapitta* vis-a-vis *Agni* which helps in digestion of food that is rich in carbohydrate, protein and fat. The pancreas is attached to the left of "C" shaped concavity of second part of duodenum, above the point of umbilicus.

Pittashaya as Gall bladder

As per *Sharira Rachana Vijnana* text book, the author has mentioned Gall bladder as organ related with *Pittashaya*. It is a pear-shaped sac for storage of *Pitta* and has capacity of 30-40ml. It is placed on *Dakshina Thata*[right edge] of *Chaturbhujakara Pinda* of *Yakrit* [quadrate lobe]. *Pitta Nalika* begins from neck of gallbladder then descends down to form common hepatic duct. The secretions of gall bladder are then emptied into 2nd part of duodenum.

Grahani as Duodenum: Further the author has corelated *Grahani* with Duodenum, the proximal part of small intestine, where macromolecules of food are converted into micromolecules by admixture with *Pachaka Pitta* and results in Digestion of Food.

Pancreas as Agnyashaya/Pittashaya- The *Agnyashaya* is *Pindakara* (lobulatory), *Dhoosara Granthi*(greyish gland).It is 12-15 cm long and placed in an *Anuprasth* fashion(transversely). It extends from duodenum to *Pleeha* behind the *Amashaya*. The *Shira* of *Agnyashaya* is lodged within concavity of duodenum and connected with *Gatra* (Body) through constricted *Greeva* (neck).Its left end which is *Puccha of the Granthi* (tail of pancreas) reaches upto *Pleeha* (spleen).*Agnyashaya Nalika* runs in the gland from *Vama* to *Dakshina Bhaga*. The duct reaches to the *Greeva of Granthi* and then turns towards *Pitta Nalika* (bile duct).Both *Agnyashaya* and *Pitta Nalika* unite to form Hepatopancreatic ampulla and open in the posteromedial part of duodenum 8-10cm distal to *Jatar Nirgam* (pylorus). *Agnyashaya* secretes *Achha Pitta* (pancreatin) which is drained through *Agnyashaya Nalika* which is joined with *Urdwapitta Nalika* coming from *Yakrit* and drain the *Pachaka Pitta*. The mixture of *Accha Pitta* and *Pachaka Pitta* are poured in

the duodenum to perform job of *Pittadhara Kala* which plays a vital role of *Pachana*. Therefore, this segment of intestine is called *Pachyamanashaya*²⁹.

Role of Pittashaya and Pachaka Pitta/Drava Agni in digestion and absorption-

The acidic chyme (partially digested carbohydrate, protein, lipid) entering duodenum (*Grahani*) stimulates secretion of secretin into blood which enhances flow of yellowish-brown bile (*Dravapitta*), secreted by hepatocytes and temporarily stored in Gall bladder. Whenever an individual consumes food which is rich in fat, the hormone called Cholecystokinin that get released into circulation stimulates the hepatocytes, and helps in contraction of gallbladder and release of bile into cystic duct. The cystic duct, joins common hepatic duct and continue as common bile duct. It joins with major pancreatic duct to form ampulla of Vater and opens into the duodenum at the summit of Major duodenal papillae.

At the same time the pancreatic cell secretes pancreozymin into blood, which stimulates secretion of pancreatic juice, rich in digestive enzymes like pancreatic amylase that helps in conversion of carbohydrate (starch) into monosaccharides (glucose, fructose and galactose). The trypsin, chymotrypsin, carboxypeptidase, elastase converts protein into peptide and further into amino acid. The triglyceride molecules are converted into fatty acid and monoglyceride by the action of pancreatic lipase.

Passage of the digested nutrients from gastrointestinal tract into the blood or lymph is called absorption. The carbohydrates, proteins are absorbed into duodenum and jejunum via active transport, whereas lipids in the form of micelles are dissolved in water of intestinal fluid by simple diffusion. Monosaccharide and amino acids are transported in blood to the liver by the way of hepatic portal system. When chyme reaches ileum, 90-95% of bile salts are reabsorbed and returned by blood to liver through hepatic portal system for resecretion³⁰.

Applied aspects of Pittashaya, Pittadhara Kala and Agnyashaya:

Agnimandya, a condition characterized by weakened digestive fire, triggered by excessive consumption of *Kaphaja Ahara-Vihara*. This leads to an imbalance of *Kapha Dosha*, causing dysfunction of *Jatharagni* and ultimately resulting in *Agnimandya*. As the root cause of many diseases, *Agnimandya*'s progression can have far-reaching consequences on overall health and well-being³¹.

Ajeerna is characterized by impaired digestion due to *Agnimandya*. The imbalance in *Agni* leads to incomplete digestion, resulting in the accumulation of *Ama*. This accumulation obstructs the normal functioning of the gastrointestinal and metabolic systems, contributing to the progression of *Ajeerna*. As a result, the body's ability to properly digest and assimilate nutrients is compromised, leading to a range of digestive and metabolic issues³².

Grahani develops when an individual with recently recovered diarrhoea and weakened digestive power indulges in *Nidana Sevana*, leading to a surge in *Doshic* imbalance. This results in *Mandagni*, afflicting the *Grahani*. The aggravated *Doshas*, either individually or in combination, further impair digestion, causing the excretion of undigested or partially digested food with a foul odour. The condition is characterized by alternating episodes of constipation and diarrhoea, accompanied by abdominal pain, ultimately manifesting as *Grahani*³³.

Amlapitta is caused by the consumption of *Atikatu Ahara*, *Akala Bhojana*, *Ati Amla Bhojana*, *Adhyashana* leading to the aggravation of the three doshas, predominantly *Pitta*. This results in weakened digestive fire (*Agnimandya*), causing undigested food to accumulate and further exacerbate *Pitta* imbalance. The dominance of *Amla-drava Guna* ultimately gives rise to *Amlapitta*, a condition characterized by acidity and digestive disturbances³⁴.

The formation of **Pittashmari** occurs when *Kaphaja Ahara-vihara* lead to an excessive buildup of *Kapha* in the *Grahani*, causing a mixture of *Kapha* and *Pitta*. This mixture results in the formation of biliary sludge, which obstructs the channels (*Srotorodha*) and provokes *Vata* due to its dry and rough properties which leads to the development of *Pittashmari*³⁵.

The **pathogenesis of Pittodara** is triggered by *Agnimandya* and consumption of unhealthy food (*Malina Ahara*), leading to the accumulation and aggravation of *Pitta Dosha*. As *Pitta* accumulates, it spreads and suppresses the digestive fire in the stomach, impairing digestion and metabolism. This complex interplay of factors ultimately gives rise to *Pittodara*, a disease characterized by the dominance of *Pitta dosha*³⁶.

Discussion-

Based on critical review it is concluded that *Pittashaya* is the term which is used for predominantly for Gall bladder where *Pitta* in the form of bile, is received, stored and condensed and given out whenever needed for the purpose of digestion of food which is rich in fat. But *Pittashaya* in a wider meaning can be taken as that region which contains *Pachaka Pitta* that is in active form and is in circulation. The region of formation and its transportation includes *Pittadhara Kala*, the lining membrane of *Pittashaya* in the form of biliary ducts of Liver, Extrahepatic biliary apparatus and predominantly Gall bladder along with association of Proximal half of midgut loop (lower half of 2nd, 3rd, 4th part of duodenum and proximal half of jejunum) and along with exocrine part of Pancreas. *Agnyashaya* is also part and partial of *Pittashaya* having the endodermal lining membrane at the caudal end of foregut, that extend and forms the lining of major and minor Pancreatic ducts within pancreas and the secretions are given out through the opening of the ducts, joining together with the bile duct and opening at the summit of major and minor duodenal papillae into the 2nd part of duodenum situated at a distance of 8-10cms and 6-8cms distal to the pyloric orifice of the stomach respectively.

Grahani is the region designated for the part of digestive tract where the food is retained, converted, segregated, digested and absorbed. The microanatomical features of small intestine like large surface area with circular folds of mucous membrane (plicae circularis), intestinal villi, microvilli and aggregated lymphatic follicles aid in the process of digestion and absorption. It contains preponderance of Biliary secretion, Pancreatic secretion, Intestinal juice along with other factors that help in acting as *Agni/Drava Pitta*, that aids in proper digestion of food. Any disturbance in status of *Agni* leads to *Grahani Roga*, the prime disease of gastrointestinal tract.

Conclusion: *Pittashaya* is considered as Gall Bladder, *Agnyashaya* as Pancreas and *Pittadhara Kala*, anatomically as lining membrane of small intestine extending from pyloric orifice of stomach upto ilio-caecal junction, functionally it's the endodermal lining membrane of small intestine, particularly lower half of second part of duodenum, upto proximal half of jejunum, where the salient features of small intestine are prominently seen based on function, along with the endodermal extension into Liver, Gall bladder and Pancreas via extension in the form of endodermal cystic bud and pancreatic bud at the junction of Foregut and Midgut of primitive gut along with intrahepatic and extrahepatic biliary apparatus. Thus, overall *Pachaka Pitta* is term used for enzymatic secretions of gallbladder, enzymatic secretions of pancreas and that of small intestine, that aids in digestion and absorption of food.

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