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A CRITICAL ANALYSIS ON GRAHANI W.S.R TO AYURVEDA AND MODERN ANATOMY

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ABSTRACT

The Ayurveda is the ancient medical science of the world. It focuses on maintaining the health of human beings. Maintaining health by proper use of Ahara(diet), Vihara(daily routine).The digestion, absorption and assimilation of food occur in gastrointestinal tract and there is clear and complete description of the digestive organs and digestive process on anatomical, physiological ground initiating from macroscopic to microscopic level in modern science. Acc to Ayurveda the chief site for digestion of food is Grahani and is considered as organ where Agni resides which in turn carry out the function of digestion. It is said that Grahani and Agni are interdependent; due to this nature these two are responsible for proper functioning of the each other. Any derangement in function of any one leads to improper digestion which in turn causes many diseases as Acarya had illustrated that most disease occur due to functionally weak Agni 3 i.e. Mandagni further Mandagni for long period leads to a chronic disease called as Grahani Roga. So, the proper Understanding of Grahani leads to better clarity of Grahaniroga which will prove as a boon for the treatment of patients.

KEYWORDS: Ayurveda, Grahani, Duodenum, Small intestine.

INTRODUCTION

Ayurveda, being a medical science, deals with the human body. There are many concepts in Ayurved, regarding human body. Modern interpreters have viewed Grahani from the angle of different regional parts of gastro intestinal tract including the associated glands and can be summarised as Dr. Ghanekara, Dr. D.S.Gauda, Dr Hari Prapanna Sharma, Dr. D. N. Banarji accepted the mucous membrane of entire small intestine as Grahani. Dr. Gananatha Sen regarded the proximal twelve finger portion of Ksudrantra (small intestine) as Grahani. Dr. V.S. Variyara concluded that pyloric valve can be considered as Grahani. Dr. Guru et al. preferred Grahani up to the large intestine as the process of absorption continues up to level of large intestine. Dr. R.K. GuptA et al. also considered Grahani to be entire small bowel & colon. The description of anatomical structure of Grahani available by now is been far from an universal acceptance. Keeping this view in mind the present study entitled "A critical review of anatomical concept of Grahani has been undertaken.

Anatomical Aspect

Acarya Caraka considered Grahani to be above Nabhi and to be present on left side while Acarya Sushruta and other Acaryas had elaborately describe the position of Grahani in comparison to Acarya Caraka and considered that it is situated between Amasaya and Pakvasaya and regarded it as PittadharaKala. It appears that there is difference in the view regarding the position of Grahani, but it is not so as Caraka Samhita mainly belongs to Atreya Sampradaya which is chiefly concerned with medicine while Sushruta Samhita belongs to Dhanvantri Sampradaya which represents school of surgeons. So, Acarya Caraka was more concerned with the physiological aspect and Acarya Sushruta with anatomical aspect that is why we get elaborate description of anatomical location of Grahani in Sushruta Samhita.

As Acarya Sushruta and other Acaryas had illustrated that Grahani is situated between Amasaya and Pakvasaya, thus in order to get the exact position of Grahani, location of Amasaya and Pakvasaya must be established. The term Amasaya and Pakvasaya are mentioned by all Acaryas in Kostha or as Kosthangas.

The nomenclature of the same Kosthangas may differ when their anatomical and physiological aspect are considered and it can be seen even in present era as the "gastrointestinal tract" is more of anatomical term while "digestive tract" is indicative of physiological aspect of the alimentary tract. This is more clearly depicted by Dr. D warkanath as - The anatomical nomenclature of different part of the Mahasrotas (G.I.Tract) can be summarised as: Amasaya (the stomach), Ksudrantra (the small intestine), Unduka (the caecum), Sthulantra (the large intestines), Uttaraguda (the upper segment of the rectum), Adharaguda (the lower segment of the rectum). The physiological nomenclature of the Annavaha Srotas (alimentary tract) is: Amasaya (the stomach), Pacyamanasaya (the small intestine), Purisadhara (the caecum), Pakvasaya (the large intestine). As it can be depicted that the Amasaya is both functional and anatomical term while Pakvasaya is more of physiological term, so the term will be considered in the same way to establish anatomically the organs related with them. Location of Amasaya according to Acarya Caraka is in between Nabhi and Stana, while Sushruta had stated it to be present above Pittashaya and also considered that Amasayadvara is situated near Hridaya which itself is present between Stana. Acarya Sharangadhara stated it to be present below the Urasa. It can be inferred that the upper limit of Amasaya is present Near the Hridaya, near between Stana, below Urasa.

Lower end of Amasaya is considered at Nabhi by Acarya Caraka and illustrated that Amasaya is present between Stana and Nabhi while Acarya Sushruta considered Nabhi to be situated between Amasaya and Pakvasaya and also regarded Pitta to be present in Amasaya and Pakvasaya Madhya region. Both seems to be indicative of same region. Nabhi term has been used in quite wide references, but yet not been fully established. It can be viewed from the two aspects – Surface anatomy - From the surface anatomy point of view it can be correlated with region around umbilicus. Visceral anatomy - From visceral anatomy aspect it can be correlated with region around pancreas or small intestine.

In modern science the organ lying in region below the heart, Urasa, Stana and above pancreas /small intestine is stomach, so Amasaya can rationally correlate with stomach. Concerning the physiological aspect of Amasaya, Acarya Caraka has said that all digestion got completed in Amasaya and its lower part is seat of Agni, other Acaryas considered that initial partial digestion of food occur in Amasaya (Bhinasanghata), the same concept is documented in modern classics also under the functions of stomach as - Its peristaltic movement softens and mixes the food with gastric juice. The gastric gland produces the gastric juice which contains enzymes that plays important role in digestion of food and after this, complete digestion and absorption of food occur in between Amasaya and Pakvasaya Madhya i.e. in Grahani. Here it appears that there is difference between the view of Acaryas regarding the role of Amasaya in digestion but it is not so as Acarya Cakrapani had clarified the doubt by dividing the Amasaya in two parts Urdhva-Amasaya and Adho-Amasaya, among these UrdhvaAmasaya was considered as site for Kapha Dosa and Adho-Amasaya for Pitta Dosa. Thus, Urdhva-Amasaya of Caraka corresponds to the Amasaya of Sushruta and other Acaryas. While Adho-Amasaya corresponds to Grahani, where whole digestion and absorption of all essential nutrient occur. Thus, Amasaya can rationally correlate with stomach.

Now, taking Pakvasaya into consideration as mentioned above this term is mostly concerned with physiological aspect. Acarya Sushruta mentioned it to be situated below the Nabhi and above Shroni and Guda also all Acarya considered it to be Mula of Purishvaha Srotas, thus it can called as organ commencing below Nabhi, mainly concerned with faeces formation. Moreover it is regarded as the site of PurishdharaKala and functions to separate mala, further more a Kala called MaladharaKala which also carry out the same function. i.e. separation of Mala and is present in Unduka part of Antra present in Kostha. Acarya Dalhana considered Unduka to be the part of Pakvasaya is of view that it is Pottali shaped with separation of Mala to be its main function. Dr. Gananatha Sen considered it as caecum .Thus, on this basis Unduka can be called as caecum. Functionally also, the main function of large intestine is formation of faeces by absorbing the water from the chyme. Thus, the initial part of Pakvasaya being Unduka can be rationally correlated with caecum and rest other part of Pakvasaya can be correlated with remaining large intestine. Taking all the aspect in consideration Amasaya can be correlated with stomach while Pakvasaya can be correlated with large intestine. The structure lying between these two organ is small intestine and this may be called as Grahani, but it needs more evaluation from physiological aspect.

Physiological Aspect

All Acarya has regarded Grahani as the seat of Agni whose chief function is to receive the food coming from Amasaya and hold it for proper digestion and after absorption of nutrients the digested food is propelled forwards to Pakvasaya. The Agni or Pacaka Pitta is responsible for digestion of food as per all Acarya, here it is worth mentioning that the subtypes of Pittas are enumerated for first time by Acarya Sushruta, afterwards all Acaryas followed it, While Acarya Caraka had emphasized on the concept Agni though the concept of Pitta was there but was not classified further. All Acaryas had clarified that Pitta and Agni are not different entity though this statement appears to be appropriate only in term of Jathragni and Pacaka Pitta as these were chief representator of Agni and Pitta respectively, also there site is almost same as described by Acaryas and are most important among them. Thus, it can be said that Pacaka Pitta, Kayagni, Antaragni, Dehagni, Jathragni, Kosthagni are one or same as far as digestive function is concerned but it is also evident that the site and function of five

Pitta are different from the thirteen Agni except the concept of Jathragni and Pacaka Pitta. An elaborate work is needed to explore the relationship between the subtypes of Pitta and subtype s of Agni. Acarya Sushruta, Vagbhatta and other Acarya regarded the Grahani and PittadharaKala to synonymous, whose chief function is digestion and absorption of food. This Kala is the lining of Grahani which absorb nutrients and digest the food by secretion of various digestive factors viz. Agni/ Pacaka Pitta, Accha Pitta. As already discussed that Pacaka Pitta and Jathragni are same entity while Accha Pitta is Pitta which is secreted when partially digested food moves from stomach towards Pitta Sthana, as seen recorded in Caraka Samhita that, "thereafter, as the partly digested food which has attained Amla Bhava is moved down, Accha Pitta is secreted". Commenting on the passage, Acarya Cakrapani Datta observes: "by the term Vidagdha means partly digested. Amla Bhava means after assuming sourness. Asayaat refers to Amasaya. The term Chyavamanasya means, being led down by Vayu to the lower portion. The entire passage means, "the partly digested food acquiring the quality of sourness when moved down from the Amasaya comes into the contact with the Pitta Sthana. By Accha Pitta is meant Aghana or light (the term Aghana has also been interpreted as swatchh or (clear). Udiryate means produced. The term Amla refers to the production of Pitta under the influence of the ÀhAra of food which has since assumed Amla Bhava (qualities of sourness)." Same description is available in modern text also as acidified chyme moved from Amasaya (stomach) and approaches the small intestines it leads to secretion of many hormones which interns responsible for secretion of many digestive enzymes and can be clearly understood.

Associated function of Grahani

1. Retention of food in Amasaya - It helps to retain food in Amasaya for proper mixing digestion. In modern classics this function is attributed to Role of the Pylorus in Controlling Stomach Emptying.
2. Argala at door of Pakvasaya - Acaryas had described the position of Grahani as Pakvasayadvara i.e at door of Pakvasaya which regulates the passage of food from Grahani to Pakvasaya. Similar concept is document regarding ileocecal valve.
3. Holding the food- Grahani hold the food for digestion and absorption as also mentioned in modern classics for small intestine as - Other than in the first part of the duodenum, large crescentic folds of mucosa project into the lumen of the small intestine, lying either transversely or slightly obliquely to its long axis The circular folds slow the passage of the intestinal contents and increase the absorptive surface.
4. Propelling the digested food further -The propelling the digested food forwards is equivalent to peristalsis of small intestine as Chyme is propelled through the small intestine by peristaltic waves.

DISCUSION

Ayurveda classicsdefine the location of Pittadhara Kala, found in "Pakwa-Amashaya Madhya". Discussion is being done previously on Pakwashaya andAmashaya. That iswhy scholar has considered both the views Ayurveda and modern science.

A careful analysis of the foregoing present for distinct views offered by modern authorities on Ayurveda viz,

- Grahani is pyloric orifices.
- Grahani is duodenum.
- Grahani is small intestine epithelial layer and
- Grahani extends from pylorus toilio-cecum including the two sphincters.
- Grahani extends from amashaya to pakwashaya

CharakaSamhitha‖ According to Ayurveda acharya prof Dhamodar Sharma Gowda GRAHANI may be called as: Agnisthana, agniadhisthana, agnaashaya, anthrani, antrashaya, kshudrantra, kshudrantavayavagrahani, grahaninadi, tejapata, dahanashaya, pakwamashayamadyampachhamanashaya, pachakashaya, pittadharakala, pittashaya, purithat. The anatomy, physiology and pathology of Grahani may be summarized as follows- According to Dr.Bynarjee Anatomically Grahani is situated (1) abovethe nabhi(2) between the pakwashaya and amashaya (3) at the gate of pakwashaya (4) it is like a membrane (kalaa). Physiologically (5) seat of agni (agnyadhisthanam) (6) receptor of food (7) it activates and suppresses the strength of the agni (8) forcibly separates and digests the undigested food (9) evacuates the fully digested food by side. Pathologically (10) evacuates the undigested food before being digested. All these indicate the seat of grahani to be in the small intestine.‖ —by Dr. BynarjeeDheku Ayurveda ShariraPrusta 282 (Parishabdhashabdharthashariram).15(B)

According to the Modern Anatomy

The small intestine is the longest segment of the gastrointestinal tract — the long, continuous pathway that food travels through your digestive system. In the small intestine, food is broken down into liquid and most of its nutrients are absorbed. The waste is passed on to the large intestine. The small intestine has three distinct regions the duodenum jejunam and ilium. The duodenum, the shortest, is where preparation for absorption through small finger-like protrusions called villi begins. The jejunum is specialized for the absorption through its lining by enterocytes: small nutrient particles which have been previously digested by enzymes in the duodenum. The main function of the ileum is to absorb vit-B12, bile salts, and whatever products of digestion were not absorbed by the jejunum.

Special Feature of Small Intestine Absorption

Digested food is now able to pass into the blood vessels in the wall of the intestine through either diffusion or active transport. The small intestine is the site where

most of the nutrients from ingested food are absorbed. The inner wall, or mucosa, of the small intestine is lined with simple columnar epithelial tissue.

Structurally, the mucosa is covered in wrinkles or folds called placae circulares, which are considered permanent features in the wall of the organ. They are distinct from rugae which are considered non-permanent or temporary allowing for distention and contraction.

Immunological The small intestine supports the body's immune system. The presence of gut flora appears to contribute positively to the host's immune system. Peyers patches, located within the ileum of the small intestine, are an important part of the digestive tract's local immune system. They are part of the lymphatic system, and provide a site for antigens from potentially harmful bacteria or other microorganisms in the digestive tract to be sampled, and subsequently presented to the immune system.

The Small‘Intestine has been mentioned as Grahani in Ayurvedic system of medicine. Literally, Grahain menas that holds ‘. The small intestine is a long organ and consisting of three main layers and.

Mucosal: The innermost layer of the grahani (small intestine) is a complex but dynamic site of identification of six tastes (diet-chemistry). Small intestine contains hair like structures, known as villi, which pushes the food particles towards the deeper layers.

Muscular: The muscular layer pefros action through the process of peristalsis (alternating contracting and relaxation). For this apparent reason, grahani has been classified mostly as mamsa…muscle tissue in Ayurveda.

Serosal: The function of the serosal layer is to interface with the general circulation so as to perform the assimilation of micro and macronutrients.

Indrabir Singh‘s Text book of Human Histology 7th eddition16 In small intestine structure like plicae circularis (valves of kerck ring) are macroscopically visible, crescentshaped folds of the mucosa and submucosa. Plicaecircularisextend around one –half to two-thirds of the circumference of the lumen of the small intestine.

CONCLUSION

By considering all authors view about Grahani (Pittadharakala) is Aagnisthanaand is also called Agnaashayaand Kshudantara, Pakwaamashaya Madhyam. Pittadharakalais nothing but where the Pachaka Pittasecrets. According to Chakrapani, Adhoamaashayameans small intestine up to ileo-ceacal junction. Thus, after thoroughly evaluating comparison of anatomical and physiological aspect of Grahani to that of small intestine it can be stated that The term Grahani can be rationally correlated anatomically as well physiologically to the organ small intestine and more precisely to inner lining of it. This term also include the functions of pyloric sphincter and ileocecal valve. So, it can be concluded that the anatomical correlate of Grahani is small intestine including pyloric sphincter and ileocecal valve.

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