AN ANATOMICAL STUDY OF PITTADHARA KALA - A REVIEW ARTICLE

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ABSTRACT

In the absence of advance modern technology, the Acharyas have explained about Kala by their divine power of observation, knowledge and logic. Kala Sharir gives us information about the important membranes and layers of the body. Kalas are the limiting membrane between Dhatu and Ashaya. They also produce and hold the Dhatus. They can be understood by their functions in the body. The specific Kalas are located at specific sites one of them is Pittadhara kala. It is situated between Pakwamashaya. The aim & objectives of this study was to compare functional aspects of Pittadhara Kala. All the relevant material was compiled from Brihatrayi and available commentaries on it. Research articles are also searched from various websites. All the references were collected & analyzed & finally conclusion was drawn. Conclusion of this study is that as per the modern science Pittadhara Kala can be compared as mucous membrane of small intestine. Thus, a precise knowledge of Kala is important for physicians to make a diagnosis at the right time & also to know if the disease is at the level of Kala.

Keywords: Duodenum, Dhatu, Kala, Pittadhara Kala

INTRODUCTION

Acharya Sushrut described kala in anatomical sense in Garbhvyakaran chapter of Sharir Sthan. He states Kala is a thin membrane which separates Dhatu from its Ashaya. The function of kala results into the formation of Dhatus. They are minute elements and by their activity they transform Dhaturasa to respective Dhatus. In the absence of advance modern technology, the Acharyas have explained about kala by their divine power of observation, knowledge and logic. Aacharya Dalhan has been said that the Kala structurally can correlate with fascia, septum, fibrous membrane, mucous membrane and serous membrane while functionally can correlate with cells or formative elements.

As on cutting wood its pith is observed, likewise Dhatus is found dissecting the musculature, the Kala are covered by Snayu spread as Jarayu and smeared with Shleshma.

Aim & objectives

1) To collect the references from different Ayurvedic texts regarding the concept of Pittadhara Kala.
2) To collect the references from different modern texts regarding small intestine and digestion.
3) To compare functional aspects of Pittadhara Kala

Material & Methods

This is conceptual type of study, all sort of references has been collected and compiled from various available Ayurvedic classics text like Sushrut Samhita, Charak Samhita, Vagbhat Samhita and available
commentaries on it. Literature is also compiled from modern textbooks. Research article is also searched from various website related to Pittadhara Kala and small intestine and digestion. All matter is analyzed, and attempt has been made to draw best possible conclusions.

**Review of Literature**

Kala is ‘Dhatwashayanter Maryada’ which separates Dhatu and Ashaya. The Ashaya is cavity which gives Ashraya to the Dosha, Dhatu and Mala. Snayu, Jarayu and Shleshma are the three basic principles in the formation of Kala; these three structures can be compared with fiber, serous and mucous layers respectively. Kala are the pith of the stem in the tissues. While describing Kala, it is said as the duramen of cores of a piece of wood or stem becomes exposed to view by cutting into it, so the Dhatu of the body may be seen by removing the successive layers. These Kalas are extensively supplied with Snayus bathed in Jarayu and encaised in Shleshma. Acharyaya Vagbhata says the Kleda which is lies in the internal part of the Ashaya that becomes Pakwa by Dhatwagni and forms as Kala. It covers the internal and external layers of the organ, and it may separate the muscle. It helps for holding, movement, supporting, absorption and lubrication in the different parts of the body. There are seven Kalas explained in Samhita.

**Pittadhara Kala**

Pittadhara Kala is on sixth number which is said to be lies in between Amashaya and Pakwashaya i.e. Grahani, which is correlated as small intestine. Grahani not only store the Chaturviddha Anna propelled from the Amashaya and on its way to the Pakwashaya but also promotes complete digestion, assimilation and absorption with the help of Pachaka pitta which is secreted by Pittadharakala. Amashaya is the part before the small intestine i.e. stomach of modern anatomy. Grahani is a Sthan of Pachakagni which helps in digestion of food. After digestion of food Ahar is converted into Aharras which is then absorbed by the Pittadharakala for the further nourishment of the seven Dhatu. Acharya Sushrut also stated Pittadhara Kala as Majjadhara kala in Kalpashtham while describing Sarpdansha Chikitsa.

**DISCUSSION**

Concept of Pittadhara Kala is explained by Acharya Sushrut. We find references about Pittadhara Kala in Ashtanga Samgraha and Sharangdhara Samhita also. All Acharya's mentioned seven types of Kala. Describing the structure of Pittadhara Kala Acharya'sussushrut has stated that it holds four kinds of food propelled from Amashaya on its way to Pakwashaya. All types of food brought into Koshtha of man becomes Jirnra and undergoing Shoshan in proper through heating agency of pitta thus Amashaya And Pakwashaya appear to be upper and lower limit of Pittadhara Kala respectively. According to Acharyavagbhatt, being the abode of internal fire, it with holds by force, the movement of food material passing form Amashaya i.e. stomach into the Pakwashaya i.e. intestine, digest food by heat of Pitta, absorbs it and allows the digested food to move further. Pittadhara Kala can be compared as mucous membrane of small intestine. The wall of the small intestine is made up of 4 layers –

1 – Mucosa
2 – Submucosa
3 – Muscular Layer
4 – Serosa (Adventitia)

According to modern anatomy following structures are responsible for digestion and absorption. Relevant features responsible for digestion.

**Mucosa**

- Major duodenal papilla – which is also called as hepatopancreatic ampulla and lies 8-10 cm distal to pyloric orifice.
- Minor duodenal papilla - at which accessory pancreatic duct opens and it lies 6-8 cm distal to pyloric orifice.
- The presence of intestinal gland i.e. crypts of Lieberkuhn which invades the lamina propria. These glands are lined by globlet cells, columnar cells, Paneth cells and enteroendocrine cells which scattered over the entire mucous membrane of jejunum and ileum.
- Functional anatomy – the above glands secrete digestive enzymes and mucous i.e. epithelial cells deep in the crypts show a high level of mitotic ac-
tivity. The proliferated cells gradually move towards the surface to be shed from the tips of the villi. In this way the complete epithelial lining of the intestine is replaced every two to four days.

- Enterocyte – absorbing water & electrolytes.
- Goblet cell- secreting mucus.
- Enteroendocrine Cell-
- 1-Secretin-Pancreatic Juice Secretion
- 2- cck- bile juice secretion.
- Paneth cell- secrete lysosomal enzyme.  

Relevant features responsible for absorption

- The length of small intestine which provides large surface area.
- villi are finger like projection, with large blood supply in the form of plexus of blood capillaries which helps in rapid absorption of nutrients into the blood.
- Plicae circularis for increase the surface area of mucosa.
- Microvilli are the smaller fold that helps to increase the surface area.

SUBMUCOSA

It is rich with Brunner’s glands i.e. duodenal glands. They secrete alkaline mucus with bicarbonates which neutralize acid effect secreted by stomach. The serosal and muscular layers correspond exactly to the general structure of alimentary canal.  

CONCLUSION

The maximum digestion takes place in duodenum supporting characteristics are as follows. The large length of small intestine provides more surface area for absorption. The intestinal glands are scattered over the entire mucosa of jejunum and ileum. Villi are large as well numerous in the duodenum and jejunum. So, we conclude that the greater length, circular folds as well intestinal glands are the main characteristics of small intestine which helps in performing digestion and absorption which is the basic function of Pachak Pitta so we can easily correlate with Pittadhara Kala.

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