



## A CRITICAL REVIEW OF *KLEDAKA KAPHA* OF AYURVEDA IN THE MODERN PHYSIOLOGICAL PERSPECTIVE

**Dr. Mula Ram Suthar**

P.G Scholar, P.G Department of Kriya Sharir, CBPACS, New Delhi, India

**Dr. Rakesh Roushan**

Assistant Professor, P.G Department of Kriya Sharir, CBPACS, New Delhi, India

### ABSTRACT

*Ayurveda* a traditional system of Indian medicine, the main aim of this system is to maintain the health of a healthy person and cure the disease of diseased. In *Ayurveda* health is a state where the *Dosha*, *Agni*, *Dhatu*, *mala*, all the physiological processes of the body are in homeostatic state and soul, sense organ and mind are in a state of total wellbeing. The theory of *Tridosha* is unique to *Ayurveda*. The term *dosha* in *Sanskrit* means the regulatory functional factors of the body. It is three *doshas*- *Vata*, *Pitta*, and *Kapha* are said to be responsible for maintenance of homeostasis in the body; and health is nothing but a state of equilibrium of these *tridosha*. These *Dosha* also determine the psycho-physiological constitution of an individual. *Dosha* are able of vitiating the different bodily tissues, when deviating from the state of equilibrium and can lead to diseases. *Kapha* dosha are heavy, dense, cold, soft, unctuous, sweet, immobile and slimy in their property. There are five subtypes of *kapha*, namely *avalambaka*, *kledaka*, *bodhaka*, *tarpana*, *kledaka*, *bodhaka* and *Sleshaka*. *Kledaka kapha* is situated in the stomach. This *kapha* is responsible for softening the food and breaking its complexity. The functions of *kledaka kapha* can be compared as per modern medical science. Very few works have been achieved on the conceptual features of *kapha*. In this article, an attempt has been made to correlate the physiological activity of *kledaka kapha* with special reference to gastrointestinal physiology. For this study, the basic materials have been collected from the *Ayurvedic* classics with the available commentaries, as well as textbooks of contemporary science have been referred for a better understanding of the concept and its evaluation with contemporary science.

**KEYWORDS :** *Ayurveda*, *Kapha dosha*, *Kledaka kapha*, Mucus Secretion, Stomach

### INTRODUCTION

*Ayurveda*, an ancient Indian holistic science, is based on the *Tridosha* theory which forms the base for all *Ayurvedic* concepts. These three *doshas* function at various levels of the organization such as cellular level, single-system level, and organism level. In *Ayurveda*, a person is said to healthy whose humours and metabolic state are in equilibrium, whose functional activities of the tissues and excretory products are in a balanced state and the soul, senses and mind are in a state of complete well being<sup>1</sup>.

*Ayurveda* is a science based on functional understanding. The concept of *tridosha* is basically a theory and any single substance or structure cannot represent a *dosha* at all times<sup>2</sup>. *Acharya Charaka* has quoted the general site of *kapha* is Chest, head, neck, joints, stomach and fat, with chest the most important of them. Properties of *kapha dosha* are heavy and dense, cold, soft, unctuous, sweet, immobile and slimy, and can be subsided by drugs and food articles possessing opposite properties.

The normal physiological functions of *kapha* in homeostatic condition, it increases Unctuousness property in the body, helps in binding structures together, provides firmness/stability in bodily structures, maintenance of bulk of the body, maintenance of sexual

vigour, the strength of body, and high class of mental faculties like intelligence and absence of greed<sup>3</sup>. The *kapha dosha* are of five types namely *avalambaka*, *kledaka*, *bodhaka*, *tarpana* and *Sleshaka*. *Acharya Sushruta* has explained the locations of five sub-groups of *kapha* are in the chest, the neck, the root of the tongue and the joints in addition to the stomach<sup>4</sup>. The *kledaka kapha* is located in the *Amashaya* (stomach including the small intestine) and due to its potency contributes the water principle to the remaining sites of *sleshma* and to the whole body. The liquid components of the secretions of Gastrointestinal tract which moistens the food, disintegrates and breaks it can be represented as *kledaka kapha*. It cannot be represented by a single entity. *Ayurveda* is the science that evidences its concept based on functional understanding. There is no specific correlation of *kledaka kapha* with contemporary modern physiology is mentioned in any ancient literature. It seems to be a problem found in student life, particularly the first year of Bachelor of *Ayurvedic* Medicine and Surgery to understand the concept of *kledaka kapha*. Increased demand for *Ayurveda* science in the present society is required to understand the depth of the *Ayurvedic* Principle in an easy mode. Hence an effort has been made to ascertain and establish the knowledge regarding the physiological function of *kledaka kapha* with concerning modern physiological perspective.

### Site and Function of *Kledaka Kapha* Explained in Different *Ayurvedic* texts:

	<i>Charaka Samhita</i> <sup>a</sup>	<i>Sushruta Samhita</i> <sup>b</sup>	<i>Astanga Hridaya</i> <sup>c</sup>	<i>Astanga Samgraha</i> <sup>d</sup>
<i>Karma</i> (Function)	The ingested food disintegrates in the stomach because of the liquids, and further it becomes soft because of the fatty substances.	Due to moistening property of <i>sleshma</i> , the food gets moist, disintegrates and becomes easily digestible.	<i>Kledana</i> (softening, by mixing with mucous) of the ingested food.	Moistening of food particles.
<i>Asaya</i>	Located in the <i>amashaya</i> (stomach)	Located in the <i>amashaya</i> (stomach)	Located in the <i>amashaya</i> (stomach)	Located in the <i>amashaya</i> (stomach)
Region	Upper portion of body	Upper portion of body	Upper portion of body	Upper portion of body
<i>Indriya</i>	-	-	<i>Ghrana</i> , <i>Jihva</i>	<i>Ghrana</i> , <i>Jihva</i>
<i>Dhatu</i>	<i>Medas</i>	-	<i>Rasa</i> , <i>Medas</i>	<i>Rasa</i> , <i>Medas</i>
Important seat	<i>Uras</i>	-	<i>Uras</i>	<i>Uras</i>
Other seats	<i>siras</i> , <i>greeva</i> , <i>parvani</i>	-	<i>Kantha</i> , <i>siras</i> , <i>klome</i> , <i>parvani</i>	<i>Kantha</i> , <i>siras</i> , <i>klome</i> , <i>parvani</i>

The *Ashita* (eatable), *peeta* (drinkable), *leeda* (lickable), and *khadita* (chewable) of these four types of food (*Chaturvedhasya*-ahara). These four types of food become humid and crumbly and easily digestible due to the properties of water; liquefaction comes from *kledaka kapha* etc.

### MODERN ASPECTS OF *KLEDAKA KARMA* OF *KAPHA*-Secretions and Characteristics of Saliva-

As soon as the food that has all the six tastes is consumed, thus when

food is taken to the mouth it is mastication process by teeth and thoroughly mixed with saliva. The primary function of saliva helps in lubrication, swallowing, appreciation of taste and facilitates speech.

The principal glands of salivation are the parotid, submandibular, and sublingual glands; in addition, there are many very small *buccal* glands. Daily secretion of saliva normally ranges between 800 and 1500 milliliters, the average value of 1000 milliliters. Saliva contains

two types of protein secretion: (1) a serous secretion that contains ptyalin (an  $\alpha$ -amylase), which is an enzyme for digesting starches, and (2) *mucus secretion* that contains *mucin* for lubricating and for surface protective purposes. The parotid glands secrete almost entirely the serous type of secretion, while the submandibular and sublingual glands secrete both serous secretion and mucus. The buccal glands secrete only mucus. Saliva has a pH between 6.0-7.0, a favorable range for the digestive action of ptyalin. It also helps for the deglutition of food taken through the oral cavity by forming a bolus of food. The bolus of food enters the esophagus and reaches to stomach through esophagus.

### Esophageal secretions

These secretions are entirely mucous and mainly provide lubrication for swallowing. The mucus secreted in the esophageal compound gland prevents mucosal excoriation by once more entering food, the compound glands located near the esophago-gastric junction shield the esophageal wall from digestion by acidic gastric juices that regularly reflux from the stomach back into the lower esophagus.<sup>9</sup> Despite this protection, a peptic ulcer can still occur at the gastric end of the esophagus.

As the boluses reaching to the *Amashaya*, it undergoes the first stage of digestion known as *madhura awasthaa paka* during which *kapha* is produced which is like froth in nature. The sweet foamy *kapha* produced in the stomach due to the sweet, sliminess, moist food. The Diet should be associated with *Madhuryatya*, *Pichhilitvat*, and *Prakalivitvatva*. If we compare this stage with the modern science, it appears that carbohydrates, fat, and protein of diet are first digested by saliva and gastric secretions.

### Gastric Secretion-

The mucus-secreting cells that line the entire surface of the stomach, the stomach mucosa has two types of oxyntic and pyloric tubular glands. They secrete large quantities of thin mucus through the mucus neck cells. The surface mucus cells are large quantities of viscid mucus that coats the stomach mucosa with a gel layer of mucus often more than 1 mm thick, thus providing defence for the stomach wall, as well as contributing to lubrication of food transport. Even the smallest contact with food or any irritation of the mucosa directly stimulates the surface mucous cells to secrete additional amounts of this thick, alkaline, viscid mucus.

### Secretions of The Small Intestine-

An extensive array of compound mucous glands, called *Brunner's glands*, is situated in the wall of the duodenum. These glands secrete large quantities of alkaline mucus in reaction to tactile or irritating stimuli on the duodenal mucosa, vagal stimulation and gastrointestinal hormones. The function of the mucus secreted by Brunner's glands is to shield the duodenal wall from digestion by the highly acid gastric juice emptying from the stomach. In addition, the mucus contains a large additional of bicarbonate ions, which add to the bicarbonate ions from pancreatic secretion.

The surfaces of both the crypts and the villi are covered by an epithelium composed of two types of cells: (1) a moderate number of *goblet cells*, which secrete *mucus* that lubricates and protects the intestinal surfaces, and (2) a large number of *enterocytes*, which, in the crypts, secrete large quantities of water and electrolytes and, over the surfaces of imminent villi, reabsorb the water and electrolytes along with end products of digestion.

### Secretions of The Large Intestine-

The mucosa of the large intestine, like that of the small intestine, has several crypts of Lieberkühn; however, unlike the small intestine, there are no villi. The epithelial cells contain almost no enzymes. Instead, they contain mainly of mucous cells that secrete only mucus. The great majority of secretion in the large intestine is mucus. The large intestinal secretions contain water, mucus, bicarbonate, sodium, chloride, potassium and calcium etc.

### Lubricating and Protective Properties of Mucus, and Significance in the Gastrointestinal Tract-

Mucus is a thick secretion composed mostly of water, electrolytes and a combination of some glycoproteins that composed of large polysaccharides bound with much smaller quantity of protein. Mucus is slightly different in different parts of the gastrointestinal tract, but in all locations, it has several important characteristics that make it both an excellent lubricant and a protectant for all of the gut.

### Properties of mucus in the gastrointestinal tract-

1. Mucus has adherent qualities that make it adhere tightly to the food or other particles and to spread as a thin film over the surfaces.
2. It has sufficient in the body that it coats the wall of the gut and prevents actual contact of most food particles with the mucosa.
3. Mucus has low resistance for slippage, so the particles can slide along the epithelium with great ease.
4. Mucus causes fecal particles to adhere to one another to form the feces.
5. Mucus is strongly resistant to digestion by the gastrointestinal enzymes.
6. The glycoproteins of mucus have an amphoteric property, which means that they are capable of buffering small amounts of either acid or alkalies; also, mucus often contains moderate quantities of bicarbonates ions, which specifically neutralize acids.

Thus, mucus has the ability to allow easy slippage of food along the gastrointestinal tract and to prevent excoriate or chemical damage to the epithelium<sup>10</sup>.

### DISCUSSION

*Vata*, *Pitta*, *Kapha* constitute three regulatory systems i.e. nervous, endocrine and immune system respectively of all living system. Among five types of *kapha*, the *kledaka kapha* is located in *amashaya* and responsible for *kledana karma* and *udaka karma* of another *kapha*. Mostly three factors are responsible for digestion. *Kledaka kapha*, *pachaka pitta* and *samana vayu*. *Samana vayu* stimulates *pachaka pitta* for digestion of food as well as separation of nutrient and waste product<sup>11</sup>. Mainly *kledaka kapha* is responsible for *Kledana* (liquefaction, hydration and softening, by mixing with mucous) of the ingested food. In the process of digestion, our food needs to be moistened and softened to break down properly and move further into the gastrointestinal tract. The main characteristic of this mucus is that it is alkaline. Therefore, the ordinary underlying stomach wall is not directly exposed to the highly acidic, proteolytic stomach secretion. Particularly after digestion of food substances, *aahara rasa* (dietary juice) is produced. The *kapha* appears in the form of a *kitta* when the action of *Rasagini* occurs on this *aahar rasa*. This *kapha*, absorbed from intestinal wall into blood vessels entre the plasma and nourishes *kapha* throughout the entire body.

From the above details, the functions of *kledaka kapha*, described by *acharyas* can be compared with the physiological functions of water, sodium, potassium, chloride, calcium, and bicarbonate ions, and mucus secretion from mucus neck cells of gastric, pyloric glands, and surface mucous cells of entire surface of the stomach. In addition, water, mucus, bicarbonate, sodium, chloride, potassium and calcium secretion from the small and large intestine.

### CONCLUSION

The *kapha dosha* is *panchabhoutika* in nature but due to the dominance of *jala* and *prithvi mahabhoota*, it performs function like heaviness, coldness, tenderness, slowness, lubrication, and the carrier of nutrients. The main function of *kledaka kapha* is *kledana karma*. Thus, *kledaka kapha* moistens the food materials, disintegrates and breaks it. This function is achieved by various chemicals secreted in the GIT. These chemicals are serous and mucous secretions of salivary glands, mucous secretion secreted by the compound gland of esophagus, mucous secretion secreted by the surface mucous cells and mucus neck cells of stomach, mucous and bicarbonate ions of secreted from Bruner's gland of the small intestine, bicarbonate ions secreted from the duct of pancreas, Alkaline mucus secretion by Brunner's Glands in the duodenum, *mucus* secreted by the *goblet cells* that lubricates and protects the intestinal surfaces, water and electrolytes secreted by the enterocytes of small intestine, mucus secreted by the epithelial cells of crypts of Lieberkühn of large intestine can be compared with the *kledaka kapha* of *Ayurveda*. There is a need of further research to evaluate in detail all other type of *kapha dosha* for the betterment of mankind.

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