



## KAPHA W.S.R. TO MUCUS GLANDS SECRETION AND LYMPHATIC SYSTEM

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## ABSTRACT

Basic concept of *Ayurveda* is based on *tridosha*. “*vayu pittam kaphashchoktah shariro dosha sangraha...*” [Ch.su. 1/57]. The three *dosha* viz *vata-pitta-kapha* are the main factors of the development, nourishment, and maintenance of the body as well as the main pathogenic factors responsible for different types of disease. The wrong utilization of food regimen and activity (*mithya ahara vihar*) etc. vitiated these *dosha*. As per *ayurveda* principles their balance makes a healthy body, on the other hand their imbalance cause disease. These *dosha* are directly descendants of *panchamahabhuta* [five elements]; two remain passive as background scenario and three are active. Out of them, *Kapha* is principally a combination of Earth and Water and is the energy that forms the body’s structure and provides the “glue” or cohesion that holds the cells together. It lubricates joints, moisturizes the skin and maintains immunity. In balance, *kapha* is expressed as love, calmness, and forgiveness. Out of balance, it leads to attachment, greed, possessiveness, and congestive disorders. In the modern medical science, the *Kapha* or *Shleshma dosha* can be co-relate with lymphatic system.

**Keywords:** *dosha, Kapha, panchamahabhuta, tridosha.*

## INTRODUCTION

*Tridoshas* are the three humors or forces of the body, which bring health when in equal quantity, and pro-

duce diseases when imbalance. The three *doshas* are called *Vata, Pitta* and *Kapha*. The equilibrium operat-

ing among *vayu*, *pitta* and *kapha*, that results in a state of their harmonious functioning, and the homeostatis implying constancy of internal environment appear to be similar in effect, and such similarity is noteworthy. *Kapha* is the third principle. According to the view of *Ayurvedic* physicians the physiological functions of human beings are subject to regulate by three fundamental principles or influences. *Kapha* is the third principle; as heat is generated and the internal fire keeps on under the influence of *pitta*, so the coolness of the body is preserved or maintained through another influence. Basically, the role of *kapha* is in generating an internal environment for maintaining such coolness; and it is almost similar to that of a water-jacket in keeping an internal combustion engine cool. Some sort of mucous secretion originates at the instance of *kapha* at the joints of different organs, in the stomach, in the respiratory passages and in the mouth. The influence of *kapha* appears whenever there is any kind of friction or any generation of heat. As the effect of this principle flows in the form of some preservative fluid, it is also named as the preservative principle. In essence, this principle of *kapha* is somewhat related to hormonal or endocrinal secretions.<sup>3</sup>

#### **Kapha Guna:**

*Guru,sita,mridu,snigdha,madhur,sthira,pichila*.  
[charaka]<sup>1</sup>

*Sweta,guru,snigdha,pichila,sita,madhura ras,lavan*  
*rasa in vidgdha avastha [ sushruta]<sup>2</sup>*

#### **Types of Kapha Dosha<sup>10</sup>**

##### **5 types of Kapha Dosha**

1. *Kledaka Kapha* - Governs moistening and liquefying of the food in the initial stages of digestion. Located in the upper part of the stomach.
2. *Avalambhaka Kapha* - It is located in the chest. By its innate strength and by the power of essence of food, it does lubrication, nourishing etc functions that are attributed to water element. It also influences the functioning of other types of *Kapha*; also Governs lubrication of the heart and lungs. Provides strength to the back, chest and heart. Located in the chest, heart and lungs.
3. *Tarpaka Kapha* - Governs calmness, happiness and stability. Nourishment of sense and motor organs. Located in the head, sinuses etc.
4. *Bodhaka Kapha* - Governs perception of taste, lubricating and moistening of food. Located in the tongue, mouth and throat.
5. *Shleshmaka Kapha* - Governs lubrication of all joints. Located in the joints.

*Snigdha,sita, guru,manda,shleshan,sthira [ vagabhatta ]<sup>4</sup>*

**The properties of Kapha are** - heaviness, Coldness, Softness, Unctuousness, Sweetness, Immobility and Sliminess, (which) are subsided by (substances having) opposite properties.<sup>5</sup>

#### **Locations of Kapha:**

Chest, Head, Neck, Joints, Stomach, fat are the locations of *Kapha* particularly the chest.<sup>6</sup>

**Function of Kapha:** Unctuousness, Binding, Firmness, Heaviness, Potency, Strength, Forbearance, Restraint and absence of greed, this is the normal function of *Kapha*.<sup>7</sup>

#### **Kalaja Nidana [Factors affect lymph production]-**

In *Shishira* and *Vasanta Ritu*, *Kapha Prakopa* takes place naturally. *Kapha Prakopa* occurs during *Purvahna*, *Pradosha Kala* (evening) and *Buktamatre* (just after food) due to diurnal effects over *Dosha*.<sup>8</sup>

#### **Symptoms of aggravated Kapha (mucous or lymph)**

Pallor, coldness, flabbiness, obesity, laziness, heaviness, loss of strength in the body, obstruction of channels, fainting, excess sleep, drowsiness, dyspnoea, coughing, excessive salivation, nausea, loss of digestive power, abnormal function of the joints. *Kapha* becomes especially aggravated by coldness, during winter and spring, in the forenoon, in the evening, and soon after eating.<sup>9</sup>

**Matra Of Kapha:**<sup>11</sup>

Rasa = 9 anjali = 1620 ml

Kapha = 6 anjali = 1080 ml

**DISCUSSION:**

**“Tartra Chetna Avasthitam Vayuh Vibhajati  
Tajah Eva Pachati, Aapah Kledayati  
Prathivi Samhanti, Aakashah Vivardhayati .....” Su  
Sharir Ch. 5/3**

In this verse *Acharya Sushruta* mention about the chief function of *mahabhuta* in the body. According to composition of *Kapha*; chief function will be *Kledana* (lubrication) and *Smahanan* (composition) in the human body. <sup>11</sup> *Kapha* or *Shelashma* described in *ayurveda* in three places i.e.; *aahar paka avastha* (it undergoes the first stage of digestion known as *madhura* (sweet) state during which *Kapha* is produced which is like froth.), *Mala of rasa dhatu* and *prakrati* in *Doshaj* description. *Rasa Dhatu* divided in two parts *Prasad bhaga* and *kitta bhaga*; *Prasad bhaga* can be divide into two parts; One is circulate in blood vessels (Plasma) which is necessary for the formation of *rakta dhatu* or blood and second is the mala of *Rasa Dhatu*, which is formed after the digestion process and circulate in lymphatic system. [ *ch. chi. 15* ] <sup>12</sup>

Lymph (from Latin, *lympa* meaning "water") is the fluid that flows through the lymphatic system, a system composed of lymph vessels (channels) and intervening lymph nodes whose function, like the venous system, is to return fluid from the tissues to the central circulation. Interstitial fluid – the fluid which is between the cells in all body tissues – enters the lymph capillaries. Lymphatic fluid is then transported via progressively larger lymphatic vessels through lymph nodes, where substances are removed by tissue lymphocytes and circulating lymphocytes are added to the fluid, before emptying ultimately into the right or the left subclavian vein, where it mixes with central venous blood. Since the lymph is derived from the interstitial fluid, its composition continually changes as the blood and the surrounding cells continually exchange substances with the interstitial fluid. It is generally similar to blood plasma, which is the fluid component of blood. Lymph returns proteins and excess intersti-

tial fluid to the bloodstream. Lymph also transports fats from the digestive system (beginning in the lacteals) to the blood via chylomicrons. The lymph formed in the human digestive system called chyle is rich in triglycerides (fat) and looks milky white because of its lipid content. <sup>13</sup>

**LYMPHATIC SYSTEM:**

Lymph is a clear-to-white fluid made of: <sup>14</sup>

White blood cells, especially lymphocytes, the cells that attack bacteria in the blood Fluid from the intestines called chyle, which contains proteins and fats Lymph nodes are soft, small, round- or bean-shaped structures. They usually cannot be seen or easily felt. They are located in clusters in various parts of the body, such as the; Neck, Armpits, Groin, Inside the center of the chest and abdomen.

**Components of Lymphatic System Are Following:**<sup>15</sup>

**Lymph:** Lymph is a fluid that circulates throughout the body in the lymphatic system. It forms when tissue fluids/blood plasma (mostly water, with proteins and other dissolved substances) drain into the lymphatic system. It contains a high number of lymphocytes (white cells that fight infection). Lymph that forms in the digestive system called chyle, this contains higher levels of fats, and looks milky white.

**Lymph vessels:** Walled, valved structures that carry lymph around the body

**Lymph nodes:** Small bean-shaped glands that produce lymphocytes, filter harmful substances from the tissues, and contain macrophages, which are cells that digest cellular debris, pathogens and other foreign substances. Major groups of lymph nodes are located in the tonsils, adenoids, armpits, neck, groin and mediastinum.

**Thymus:** The thymus is a specialized organ of the immune system, located between the breastbone and heart. It produces lymphocytes, is important for T cell maturation (T for thymus-derived).

**Spleen:** The spleen is an organ in the upper left abdomen, which filters blood, disposes of worn-out red blood cells, and provides a 'reserve supply' of blood. It contains both red tissue, and white lymphatic tissue.

Different parts of the spleen specialize in different kinds of immune cells.

Unlike the cardiovascular system, the lymphatic system is not a closed system. The human circulatory system processes an average of 20 litres of blood per day through capillary filtration, which removes plasma from the blood. Roughly 17 litres of the filtered plasma is reabsorbed directly into the blood vessels, while the remaining three litres remain in the interstitial fluid. One of the main functions of the lymphatic system is to provide an accessory return route to the blood for the surplus three litres.<sup>16</sup>

**The major (encapsulated) lymphatic organs are the lymph nodes, thymus and spleen. In addition, the lymphoid tissues include:**<sup>17</sup>

**Mucosa-associated lymphoid tissue (MALT)**

These are bundles of lymphatic cells, called lymphatic nodules, located within the mucus membranes that line the gastrointestinal, respiratory, reproductive, and urinary tracts. These nodules contain lymphocytes and macrophages which defend against invading bacteria and other pathogens that enter these passages along with food, air, or urine. These nodules can be solitary or grouped together in clusters.

Major clusters of lymphatic nodules include:

- **Tonsils:** These are clusters of lymphatic tissue under the mucous membrane lining of the nose, mouth, and throat. Lymphocytes and macrophages in the tonsils provide protection against foreign substances and pathogens that enter the body through the nose or mouth.
- **Adenoids:** A cluster of lymphatic tissue that hangs from the upper part of the back of the nasal cavity. Adenoids get bigger after birth but usually stop growing by the age of 7. Like the Tonsils, they can be removed without significantly increased risk of infections.
- **Payer's patches:** These are clusters of lymphatic nodules in the mucosa that lies the ileum of the small intestine. They play an important role in defending against the large number of pathogens that enter the gastrointestinal system.

**There are three primary functions of the lymphatic system:**<sup>18</sup>

1. Maintenance of fluid balance
2. Facilitation of the absorption of dietary fats from the gastrointestinal tract to the bloodstream for metabolism or storage
3. Prevention of infection: The lymphatic system is responsible for picking up excess interstitial water and protein as well as other cells, including bacteria, which can enter the tissue through small cuts or breaks in the skin. Bacteria and other antigens are transported by the lymphatic system from the interstitium to lymphocytes in the lymph nodes, where an immune response may be initiated

**Avalambaka Kapha:**

According to wisdom Library; *Avalambaka Kapha*: Situated in the thorax, '*Avalambaka Kapha*' protects the '*Trika*' and other vital structures like heart, through what is called '*Ambukarma*'. Other anatomical sites where other types of '*Kapha*' are situated also are dependent on this (*Aṣṭāṅgahṛdayasaṃhitā Sūtrasthāna* 12/15-16). '*Trika*' region indicates the meeting point of three bones. As this is present in thorax, it must be indicating the junction between the sternum and clavicles, behind which, the thymus gland is situated. '*Ambu*' means liquid or water. So, '*Ambukarma*' must be referring to lymphatic drainage.<sup>19</sup>

Which is quite similar the physiology of lymphatic drainage in the human body.

**Kledaka And Bodhaka Kapha:**

*Kledaka* and *Bodhaka Kapha* can be co-related with mucus which is produced in many sites in the body by mucus glands in the lining tissues of multiple organs, including the:

- Lungs; Sinuses; Mouth; Throat; Nose; Gastrointestinal Tract.

Mucus is a slippery aqueous secretion produced by, and covering, mucous membranes. Mucus is made up of a fluid component of around 95% water, the mucin secretions from the goblet cells, and the sub mucosal glands (2%–3% glycoproteins), proteoglycans (0.1% – 0.5%), lipids (0.3% – 0.5%), proteins, and DNA. It is

typically produced from cells found in mucous glands, although it may also originate from mixed glands, which contain both serous and mucous cells. It is a viscous colloid containing inorganic salts, antimicrobial enzymes (such as lysozymes), immunoglobulins, and glycoproteins such as lactoferrin and mucins, which are produced by goblet cells in the mucous membranes and submucosal glands. Mucus serves to protect epithelial cells in the linings of the respiratory, digestive, and urogenital systems, and structures in the visual and auditory systems from pathogenic fungi, bacteria and viruses. In the human digestive system, mucus is used as a lubricant for materials that must pass over membranes, e.g., food passing down the esophagus. Mucus is extremely important in the gastrointestinal tract. It forms an essential layer in the colon and in the small intestine that helps reduce intestinal inflammation by decreasing bacterial interaction with intestinal epithelial cells. The layer of mucus of the gastric mucosa lining the stomach is vital to protect the stomach lining from the highly acidic environment within it. Most of the mucus in the body is produced in the gastrointestinal tract. The body produces a lot of mucus -- about 1 to 1.5 liters per day. Salivary glands can be classified as serous, mucous or seromucous (mixed). In serous secretions, the main type of protein secreted is alpha amylase, an enzyme that breaks down starch into maltose and glucose, whereas in mucous secretions the main protein secreted is mucin, which acts as a lubricant. In humans, between 0.5 and 1.5 liters of saliva are produced every day. The secretion of saliva (salivation) is mediated by parasympathetic stimulation; acetylcholine is the active neurotransmitter and binds to muscarinic receptors in the glands, leading to increased salivation. The fourth pair of salivary glands, the tubarial glands discovered in 2020 are named for their location, being positioned in front and over the torus tubarius.<sup>20</sup>

**Tarpak Kapha:** Nourishment of sense and motor organs. Located in the head, sinuses and cerebro-spinal fluid, lacrimal fluid.<sup>21</sup>

**Shleshmaka Kapha:** *Shleshmaka Kapha* can be correlate with Synovial fluid. Synovial fluid contains lubricin (also known as PRG4) as a second lubricating

component, secreted by synovial fibroblasts. Chiefly, it is responsible for so-called boundary-layer lubrication, which reduces friction between opposing surfaces of cartilage. There also is some evidence that it helps regulate synovial cell growth. Synovial fluid is a small component of the transcellular fluid component of extracellular fluid. It also contains phagocytic cells that remove microbes and the debris that results from normal wear and tear in the joint.<sup>22</sup>

#### **Disorders due to excess of Kapha:<sup>23</sup>**

**In Ayurveda 20 *Shleshma Vikara* [Mucus and lymphatic disorders] namely: -**

1. *Trapti* (Anorexia)
2. *Tandra* (Drowsiness)
3. *Nidra Aadhikya* (Excessive sleep)
4. *Staimitya* (Timidness)
5. *Guru Gatrata* (Heaviness in the body)
6. *Aalsayam* (Lethargy)
7. *Mukha Madhurya* (Sweet taste in the mouth)
8. *Mukhasrava* (Salivation)
9. *Shleshma Udgiranam* (Mucous expectoration)
10. *Malasyadhikam* (Excessive excretion of faeces)
11. *Balaska* (Weakness, indigestion)
12. *Hridya Uplepa* (A feeling like the heart is covered)
13. *Kapha Uplepa* (Phlegm adhered to the throat)
14. *Dhamani Pratichaya* (Hardening of the blood vessels)
15. *Galagand* (Goitre)
16. *Atisthauayam* (Lipid Disorders Like Hyperlipidemia)
17. *Sheeta Agnita Or Mandagni* (Loss of Appetite or Digestive Fire)
18. *Udarda* (Urticaria)
19. *Shweta Avabhasta* (Pallor)
20. *Shweta netra varchasva* (Whiteness of urine, eyes and stools)

In addition to these, *Chirakri* or Chronic diseases, *Arbuda* (cancer), itching over the body, excessive horripilation, cardiac diseases, vomiting, chronic rhinitis, bronchitis, sensation in lips, throat, tongue, gums, palate, nose, eyes, ears and earlobes, ineffectiveness of wisdom.

**Vyadhiksamatwa As Prakrashtu Balam-**

The verse quoted by Acharya Charaka in *Charaka Samhita* is:

**“prakrastu balam shleshma vikrato mala uchyate; sach eva oja smrate kaya sa cha paathyopdishyate.”**

means in the natural manner *Shleshma* is *bala* (immunity) and in a unhealthy body it is a *mala* (disease factor).<sup>24</sup> Resistance to diseases or immunity against diseases is of two kinds i.e. the one which attenuate the manifested disease and other variety prevents the manifestation of diseases. It may be correlated to concept of immunity. *Sahaja bala* may be correlated to innate immunity. *Kalaja* and *Yuktikrita bala* may be correlated to acquired immunity. Various factors which contribute towards *vyadhi-kshamatwa* are normal *doshas*, equilibrium state of *dhatu*s (bodily tissues), normal *agni* (digestive fire), patency of *srotas* (microchannels) etc. During certain conditions or due to certain factors even unwholesome (*ahitakara*) dietary practices do not produce disease immediately.<sup>25</sup> All unwholesome (*ahitekar*) food articles are not equally harmful, all *doshas* are not equally powerful; all persons are not equally capable of resisting diseases.<sup>26</sup>

**Lymphatic system and immunity:**<sup>27</sup>

The lymphatic system maintains host peripheral tolerance during normal conditions, and quickly initiates protective immunity against foreign antigens upon stimulation. Lymphatic vessels are present throughout the body, except in the central nervous system and bone marrow. The lymph nodes (LNs), spleen, and other secondary lymphoid organs (e.g., Payer's patches) are strategically located in anatomical sites where they collect foreign antigen and antigen presenting cells to activate antigen-specific lymphocytes efficiently. In the peripheral tissues, specialized lymphatic capillaries—called initial lymphatic vessels—allow soluble materials and cells to enter the lymphatic system easily. The collected fluid and cells form lymph, which is transported by smooth muscle-invested collecting lymphatic vessels to the draining lymph node. The lymph node provides a highly organized micro architecture that supports optimal immune surveillance. The “filtered” lymph fluid, as well as naive

and activated lymphocytes, exit the lymph node via efferent lymphatic vessels. Lymphatic capillaries, collecting lymphatic vessels and lymph nodes together provide protective immunity for the body. Disruptions of lymphatic function compromise immune function and result in lymphodema.

**CONCLUSION**

Ayurveda is not as much scientific like today but thousands of years ago it looks like pro scientific. *acharya charaka and sushruta* explained the *Kapha* with its properties and places in human body. They well known about immunity or *vyadhikshmatwa*, mucus and salivary glands, lymphatic system (*rasa vaha nadiyan*) is differ from circulatory system (*rakta vaha srotsa*) etc. even though the disorders are quite similar to lymphatic disorders and hyper secretion of mucus glands.

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