



# A Critical Review of Tarpaka Kapha of Ayurveda W.S.R. To Modern Physiological Aspects

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## ABSTRACT

According to Ayurveda a Person is said to be healthy when dosha, agni, dhatu all the physiological process are in homeostatic state and soul, sense organ and mind are in a state of total wellbeing. As Acharya Susruta said that our body is made up of dosha, dhatu and mala. Theory of tridosha is a unique concept of Ayurveda. Kapha dosha plays a major role in maintenance of structural and functional integrity of the body. Kapha doshas are five types namely sleshmak, bodhak, tarpak, kledak and avalambak kapha. Tarpaka kapha is located in the head and it is represented in the form of cerebrospinal fluid and other interstitial fluid in the brain. It also nourishes and soothes the sensory organs by virtue of its snehana qualities. The function of tarpak kapha can be compared as per modern medical science. Very few works have been achieved on the conceptual features of tarpaka kapha. In this article, an attempt has been made to correlate the physiological activity of tarpaka kapha with special reference to cerebrospinal fluid and interstitial fluid physiology. For this study the basic material 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 concepts and its evaluation with contemporary science.

**Keywords:** Ayurveda, Kapha Dosha, Tarpaka Kapha. Cerebrospinal Fluid

## INTRODUCTION

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>1</sup> Three doshas are present in the body Vata, Pitta and Kapha. Whole ayurvedic science is based on the Tridosha theory. "Dooshyanti iti Dosha"<sup>2</sup> the factors in the body, which pollutes themselves and start to pollute certain other factors, are called as doshas. These three doshas also maintain the health of an individual by controlling the physiological factors in the body.

These three doshas function at various level of the organization such as cellular level, single system level, and organism level. Acharya Charak has quoted the general site

of kapha in 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.<sup>3</sup>

The normal physiological functions of kapha in homeostatic condition, it provides unctuousness, act as a binding agent and maintains the structural integrity of body. Gives stability and helps in stout built of the body. Promote the bulk of body by means of which heaviness increases. Maintains sexual potency and reproductive capacity, the strength of body, and high class of mental facilities like intelligence and absence of greed.<sup>4</sup> The kapha dosha are of 4 types namely avalambaka, kledaka, bodhaka, tarpaka and Sleshaka. Acharya Sushruta has explained the locations of 4 sub-groups of kapha are in the chest, the neck, the root of the tongue and the joints in addition to the stomach. The tarpaka kapha is located in the shira (brain) and due to its workmanship of its Snehana and Tarpana qualities it nourishes and soothes (pleasing) the all indriyas and enable them to perform their specific functions.<sup>5</sup> This kapha nourishes all indriyas by nourishing the brain, cerebrospinal fluid is the partially similar to the Tarpaka kapha. CSF fills the cerebral ventricles and subarachnoid space. Through this CSF only nourishing materials and metabolites exchange from capillaries and nerve cells and act as a shock absorber. This supportive, nutritive and defence functions of the CSF will definitely helps for the normal functioning of the sensory and motor actions of the nervous system.

Ayurveda is the science that evidences its concept based on functional understating. There is no specific correlation of tarpaka 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 tarpaka 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 tarpaka kapha with concerning modern physiological perspective.

#### Site and Function of Tarapaka kapha Explained in Different Ayurvedic Texts:<sup>6</sup>

	Charaka Samhita	Sushruta Samhita	Astang Hridaya	Astang Samgraha
Karma	Tarpak	Snehana and santarpana	Tarpana of Indriyas	Indriya tarpana
Asaya	shira	Shira	shira	Shira
Region	head	Head	head	Head
Dhatus	meda	Meda	meda	Meda

#### Modern Aspects of Tarpaka Karma Of Kapha

- CSF i.e. cerebrospinal fluid circulating through sub-arachnoid spaces of meninges and ventricles of brain.
  - Endolymph and perilymph in internal ear.
  - Aqueous and vitreous humours in eyeball
  - Mucus secreted in cranial sinuses

All the fluids put together should be considered as tarpaka kapha.

**C.S.F.-<sup>8</sup>**

Cerebrospinal fluid (CSF) is a clear, colorless liquid that protects the brain and spinal cord from chemical and physical injuries. It also carries oxygen, glucose, and other needed chemicals from the blood to neurons and neuroglia. CSF continuously circulates through cavities in the brain and spinal cord and around the brain and spinal cord in the subarachnoid space (between the arachnoid mater and pia mater). The total volume of CSF is 80 to 150 mL (3 to 5 oz) in an adult. CS contains glucose, proteins, lactic acid, urea, cations (Na<sub>+</sub>, K<sub>+</sub>, Ca<sub>2+</sub>, Mg<sub>2+</sub>), and anions (Cl<sup>-</sup> and HCO<sub>3</sub><sup>-</sup>); it also contains some white blood cells. CSF provides an optimal chemical environment for accurate neuronal signaling. Even slight changes in the ionic composition of CSF within the brain can seriously disrupt production of action potentials and postsynaptic potentials.

CSF is the medium through which many substances, particularly nutritive substances and waste materials are exchanged between blood and brain tissues CSF allows exchange of nutrients and waste products between the blood and nervous tissue.<sup>9</sup>

**Aqueous humor and Vitreous Humor**

Aqueous humor is a thin fluid present in front of retina. It fills the space between lens and cornea. This space is divided into anterior and posterior chambers by iris. Both the chambers communicate with each other through pupil. Aqueous humor is formed by ciliary processes. It is formed from plasma within capillary network of ciliary process by diffusion, ultrafiltration and active transport through the epithelial cells lining the ciliary processes. After formation, aqueous humor reaches the posterior chamber by passing through the suspensory ligaments. From here, it reaches the anterior chamber via pupil. Formation of aqueous humor is a continuous process. Rate of formation is about 2 to 3 μL per minute. Amount of aqueous humor in anterior chamber is about 230 μL to 250 μL and in posterior chamber it is about 50 μL to 60 μL. Aqueous humor Maintains the shape of eyeball, Maintains the intraocular pressure, Provides nutrients, oxygen and electrolytes to avascular structures, Removes the metabolic end products<sup>10</sup>Endolymph and Perilymph

The internal (inner) ear is also called the labyrinth because of its complicated series of canals. Structurally, it consists of two main divisions: an outer bony labyrinth that encloses an inner membranous labyrinth. The bony labyrinth is a series of cavities in the petrous portion of the temporal bone divided into three areas:

- (1) the semicircular canals
- (2) the vestibule, both of which contain receptors equilibrium,
- (3) the cochlea, which contains receptors for hearing.

periosteum and perilymph. This fluid, which is chemically similar to cerebrospinal fluid, surrounds the membranous labyrinth, a series of epithelial sacs and tubes inside the bony labyrinth that have the same general form as the bony labyrinth. The epithelial membranous labyrinth contains endolymph. The level of potassium ions (K<sub>+</sub>) in endolymph is unusually high for an extracellular fluid, and potassium ions play a role in the generation of auditory signals. [12] Olfactory receptors are the first-order neurons of the olfactory patreceptor is a bipolar neuron with an exposed knob-shaped dendrite and an axon projecting through the cribriform plate and ending in the olfactory bulb. The parts of the olfactory receptors that respond to inhaled chemicals are the olfactory hairs, cilia that project from the dendrite. Chemicals that have an odor and can therefore stimulate the olfactory

hairs are called odorants.

## Discussion

The BruhatTrayi were scrutinised regarding the references for the Guna and Karma of the Tarpaka Kapha. Later, physiologico-anatomical aspects of Cerebrospinal fluid which is responsible for the nourishment of different centres of the brain, fluids present in eye, ear, nose, tongue which is responsible for the nourishment of receptors in respective sense organ were studied from modern physiology books. Later, supportive correlation was done between Ayurvedic and modern views to build valid and reliable hypothesis regarding Tarpaka Kapha in relation to the various anatomical and physiological aspects of the nourishing fluid & structures in head region. through which many substances, particularly nutritive substances and waste materials are exchanged between blood and brain tissues CSF allows exchange of nutrients and waste products between the blood and nervous tissue. Receptor cells present in sense organs get nourishment from the fluid medium or from the structures like supporting cells etc. In eyeball, Aqueous humor provides nutrients, oxygen and electrolytes to avascular structures, Removes the metabolic end products. In ear, the bony labyrinth is lined with periosteum and perilymph. This fluid, which is chemically similar to cerebrospinal fluid & the epithelial membranous labyrinth contlevel of potassium ions (K\_) in endolymph is unusually high for an extracellular fluid.

In tongue & nose, Supporting cells are columnar epithelial cells of the mucous membrane lining the nose, tongue. They provide physical support, nourishment and electrical insulation for the gustatory, olfactory receptors and they help detoxify chemicals that come in contact with the gustatory, olfactory epithelium. **CONCLUSION**

There are five types of Kapha mentioned in Ayurveda namely Bodhaka, Sleshaka, Tarpaka, Avalambaka, Kledaka. The Vishesha Sthana of Tarpaka Kapha is said to be Shirah(head). The main function of Tarpaka Kapha is said to be nourishment of Indriya (senseorgans/centres controlling sense organs). The functions of Tarpaka Kapha is similar to the functions of Cerebrospinal fluid which is responsible for the nourishment of different centres of the brain which control sense organs, fluids/ nourishing structures present in eye, ear, nose, tongue which is responsible for the nourishment of receptors in respective sense organ. Receptor cells present in sense organs get nourishment from the fluid medium or from the structures like supporting cells etc. In tongue & nose, Supporting cells are columnar epithelial cells of the mucous membrane lining the nose, tongue. They provide physical support, nourishment and electrical insulation for the gustatory, olfactory receptors and they help detoxify chemicals that come in contact with the gustatory, olfactory epithelium. Kapha is also said as Bala & is responsible for Vyadhikshamatva i.e. fighting against the pathogens. In modern physiology the Tarpaka Kapha can be correlated with CSF, Aqueous Humor and Vitreous humor , endolymph and Perilymph etc. helps not only in nutrition perception but also in other way.

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