



## CLINICAL CONSIDERATION OF KALA SHARIRAI AND ITS CORRELATION WITH BIOLOGICAL MEMBRANE

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### ABSTRACT

*Kala* is a unique ayurvedic idea that *Acharaya sushruta* explains in the *Sushrut samhita*. *Acharya Sushruta* while making sense of the advancement of body parts in *Garbhavyakaran Sharir* section of *Sharir sthan* referenced the ideas of *Kala*. As per Ayurveda body contains seven *Kala*, between *Dhatu* and *Aashaya* our body's lined by membrane, or layers. These are minute particles and undetectable by necked eye. The *Kala Sharir* represent layers in the body which is playing significant part in performing body physiology. There are many layers or films in the body which acts as an envelope of the organs. The term "*Kala*" refers to the sheath or beholding membrane of internal organs, which is functional in nature. The cell membranes that separate each cell from the others can be considered *Kala*. Additionally, it provides the underlying bodily organs with structural support. Except for *Acharyas Sushruta* and *Vagbhata*, the majority of *Acharyas* do not much research on the subject of *Kala*. Considering this aspect present article summarizes some key facts related to the *Kala Sharira*.

**KEYWORDS:** *Ayurveda, Kala Sharira, Anatomy, Membrane.*

### INTRODUCTION

Ayurveda primarily focuses on maintaining good health through disease prevention and treatment. In this regards numerous classics of Ayurveda provide in-depth descriptions of the human body's characteristics. Ayurveda *Acharyas* described various anatomical organs of body in details along with their physiological functioning. Ayurveda elaborated term *Kala Sharira* with reference to membrane of the body. The majority of *Acharyas* not discussed about *Kala Sharira*, however *Sushrut Samhia*, a classic of Ayurveda, had mentioned this subject and provided a very helpful explanation.<sup>[1-4]</sup>

*Kala Sharira* resembles membrane of body, which are seven in number and these are sheaths or layer present among *Dhatu* and *Ashaya*. The organ's physical shape can be determined by its distinguishing membrane. *Kala* is produced by the heat generated through liquid portion that lies between *Dhatu* and *Ashaya*. *Kala* is not just a physical entity but also a functional component in the production and circulation of each *Dhatu*. They are further divided into three groups: *Snayu Pratichana*, *Jarayu Santat*, and *Shleshma Vestita*.<sup>[4-7]</sup>

- *Snayu pratichana kala* is a film of connective tissues like apponeurosis, tendons, ligaments and facia. It is an outer layer of mucous of organs like respiratory and circulatory system.

- *Jarayu santata kala* is a membrane made of fibrous connective tissue that makes up the superficial and deep fascia, which are parts of muscles.
- *Shleshma veshita kala* are membranes that secrete fluids and are made from fibrous epithelial tissues.

Seven *Kala* have been identified as limiting membranes in Ayurveda, they are the internal linings of different body viscera. *Sushrut* defines *Kala* as structures resembling sheaths that are covered in *Shleshma*, or mucoid material. They have additionally been recognized as inward most restricting coating of *Dhatu* and *Ashaya*. They are known as mucous membranes in contemporary anatomical terminology.

Epithelium originates from all three germinal cells embryologically. They are mesothelic cell layers lining, interior pits and proximal pieces of urogenital plot lining. They line pericardial, pleural and peritoneal depressions. Endothelium is those linings which line veins and lymphatics.

*Sushrut* has identified seven such linings or layers (*Kala*) as depicted in **Figure 1**. Physiologically these members acts as coating lining and protect organs, *Kala* (membrane) distinguish organs from each others, these layers forms boundary of specific organs so its shape and

size can be defined. They also produce *Dhaturasa*, provide lubrications, and protect stomach from harmful effect of acids, support and holds organs on their places. *Kala* protect organs from shock and resist effect of external stimuli.<sup>[7-9]</sup>



Figure 1: Layers or Membrane of Body (*Kala Sharira*).

#### ✓ *Mamsadhara kala*

The first *Kala* is *Mamsa dhara kala* with in this *Kala* the organization of *Sira*, *Snayu* and *Dhamani* are spread. *Sushrut* has thought about the physical picture of *Mamsadhara kala* with that of lotus tail present in sloppy water.

#### ✓ *Raktadhara Kala*

The second *Kala* is *Raktadhara kala*, this *Kala* can be compared to the endothelial lining of veins, arteries and lymphatics. Blood can flow through blood vessels and *Rakta dhara kala* support this activity. *Rakta dhara kala* is considered as the seat of organs that make blood and associated with liver and spleen.

#### ✓ *Medodhara Kala*

Third *Kala* is known as *Medodhara kala*, *Meda* is found in *anu asthi*, which means that it has short bones, while *Majja* is found in *sthoor asthi*, which means that it has large and heavy bones. *Medodhara Kala* covers fatty parts of body and organs rich in fats.

#### ✓ *Shleshmadharakala*

The fourth *Kala* is *Shleshmadharakala*, which is found in the membrane of the synovium. This is available basically in all *Sandhi* and look like the ointment in a wheel hub which allows the wheel to move round. Similar to the *Sleshma* and *Sleshmadhara kala*, the *Shleshma* permits all bony joints to move freely on their axis. This synovial layer is greased up with synovial liquid.

#### ✓ *Purishdhara Kala*

*Purishdhara kala* is the name of the fifth *Kala*; this *Kala* is intended to support feces. It is found in the abdominal cavity and *Pakvashaya*. This *Kala* reach out from *Yakruit* to entire internal organ or the leftover sections of internal organ which encompass other viscera's of midsection. *Purishdhara kala* has property of isolating *Kitta* and *Sara bhag*.

#### ✓ *Pittadhara Kala*

The 6<sup>th</sup> *Kala* is *Pittadhara kala* that holds all four kind of food admitted by mouth into digestive system. *Asit*, *Khadit*, *Peeta* and *Leedh* are the four types that are brought into the small intestine.

#### ✓ *Shirkadhara Kala*

The seventh and final *Kala* that *Sushrut* has identified is the *Shurkadhara kala*. According to *Sushrut*, this *Kala* is present throughout the body of every living thing and can be found within the entire body. Here the term *Shukra* is utilized for oestrogenic and androgenic chemicals which flow in the whole body.<sup>[8-10]</sup>

#### Modern Aspect of *Kala* (Membrane)

Biological membrane is a lipid bilayer, of phospholipid, that contains fatty acid chains which determines length of membrane. Lipids give cell layers a liquid portion, with a consistency and solid framework. Many small, fat-soluble molecules can pass through the membrane, but large, water-soluble molecules, like sugar and electrically charged ions can't pass through the membrane.

During the embryonic period itself, membranes are mostly formed from epithelial, connective and adipose tissues. Mucous and serous secreting membranes are the two types of membranes produced by epithelial tissue; the first type secretes a thick jelly-like fluid called mucus and is found inside all of the organs of the digestive, respiratory and circulatory systems. The serous membranes on the other hand secrete a thin watery fluid and are found encasing specific organs like the lungs, testes and heart.

Membranes made from connective tissue with variety of shapes, including long, flat and cylinder. Storage tissue forms thin or thick membranes or layers in various places. It is available in the subcutaneous tissue, stomach wall, bone marrow, structures cushioning around certain organs like kidneys and eyeball. Membrane not only covers organs but also provide support and stability to body frame. Membrane prevent and protect organs from shock and defined specific shape or size of organs.

#### CONCLUSION

*Kala sharira* is film and layer of the body which participates in numerous physiologies and anatomically these layers play vital role inside the human body since they covers organs and separate them from each others. They also make and store important body parts like

blood vessels and mucus, etc. As per Ayurveda body contains seven *Kala*, which are found between *Dhatu* and *Aashaya*. These are acts as layers or lining of organs, in modern term *Kala* can be correlated to the membrane. There are seven *Kala* in body namely; *Mamsadhara Kala*, *Raktadhara Kala*, *Medodhara Kala*, *Shleshmadhara kala*, *Pureeshadhara kala*, *Pittadhara kala* and *Shukradhara kala*. These layers (*Kala*) acts as protective coating for *Ashayas*, produces *Dhaturasa*, provides lubrications and helps to holds vital parts of the body.

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