



## A CONCEPTUAL STUDY OF KALA SHARIR DESCRIBING AYURVEDA AND MODERN ASPECT W.S.R. TO RAKTADHARA KALA

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### ABSTRACT

Kala was first time described by *Sushruta*. He has explained *kala* as a barrier between *dhatu* and its *ashaya*. *Vagbhata* has then added embryological development that it is the important physical and functional components of the body. *Kala* is a unique concept explained by *Acharya Sushrut*. There are seven *Kalas* present in the body which are covering between *Dhatu* and *Aashaya*. The specific *Kala* is located at specific site, in which second *kala* is *Raktadhara kala*. Acharyas of *Ayurveda* have described the Anatomy & Physiology of *Raktadhara kala* in very brief manner. It is explained that *Raktadhara kala* holds the *Raktadhātu*. *Hridaya* (Heart) is an important organ of blood circulatory system but it is not included as a specific site of *Raktadhara kala*. It present especially in *sira*, *yakrita* and *pleeha*.

**KEYWORDS :** Kala, Raktadhara Kala, Aashaya, Dhatu

### INTRODUCTION-

*Rachana Sharir* is one in every of the basic sciences. Every concept of *Ayurveda* has its own importance. *Dhatu* along with the *Malas* are formed by the *Kalas* which are minute and invisible. *Sushruta* was the primary to explain *Kala*. *Kala*, he explains, could be a barrier between *dhatu* and its *ashaya*. They function a protective coating for the *ashayas* further as a barrier between the *ashayas* and therefore the *dhatu*. Layers or membranes within the body are mentioned as *kala*. As the cross section of the wood will shows the various layers and parts of its internal structures as layer by layer and thin layer separates the various layers of structures. Similarly, the membrane appears by the cross section of the fleshy a part of the body or any muscular regions or any internal parts of the organs. it's also a limiting membrane or covering between *Dhatu* and *Aashayas*. In our whole lifespan, formation and development of *Bhavpadarthas* are happening by these *kalas*. The *Dhatu*s along with the *Malas* are formed by the *Kalas* which are minute and invisible. Their activity leads to production of the several tissues (*Dhatu*s). During the conversion, waste matter is *Kapha*. In line with this theory, there are seven *kalas* within the body. *Raktadhara kala* is additionally one amongst them which is described as second *kala* by *Acharyas*. It present inside the flesh (muscle) within which *Shonita* (blood) contains & is found especially in *Sira*, *Yakrit* & *pleeha*.

### AIM AND OBJECTIVE-

To study the *kala sharir* specially *Raktadhara kala* in *ayurvedic* & modern aspect.

### MATERIAL AND METHOD

Classical texts of *Ayurveda* viz *Bruhatrayee* along with their commentaries *Sushruta Samhita*, *Ashtangasangraha*, *Ashtangahridaya*, *Bhavprakash* and *Sharangdhar Samhita*.

### OBSERVATIONS AND RESULTS

*Acharya Sushrut* has explained the *kalas* in *Garbhavyakaran shareer*. Although *kalas* are explained in embryonic life, they're found to be functioning throughout life. The *kalas* are latent and very minute particles invisible to naked eyes as are the cells within the physical body. This limitation or covering between *Dhatu* and *Aashaya* is *kala*.<sup>(1)</sup> References of *kalas* are found in *Sushrut samhita*, during the treatment of snake bite. The snake poison is found to successively attack the seven *Kalas* or fascia and provides rise respectively to the seven stages of poisoning.<sup>(2)</sup> There are total seven *Kalas* within the body. The method of formation of *Dhatu* takes place in many stages. Within the initial stage, as per *Ksheeradhi nyaya* i.e. *kramaparinam* theory mentioned within the *Charak Samhita*, *Navaneet* is present within the milk in subtle form; it's manifest only after *Uttarottar* (successive) processions. Similarly, some a part of one *Dhatu* is converted into next *Dhatu* like *Ras* into *Rakta*, *Rakta* into *Mansa*, *Mansa* into *Meda*, *Meda* into *Asthi*, *Asthi* into *Majja* and lastly *Majja* into *Shukra*. During this way *Uttarottar Dhatu* (successive tissue) formation takes place. Within the initial stage, *Dhatu* is within the kind of liquid, which is named as *Dhaturasa*. This *Dhaturasa* gets converted into next *Dhatu*. *kleda* i.e. *Dhatu*sara *shesh* or *Dhatu*sara *vishesh* isn't converted into *Purva* (previous) *Dhatu* or *Uttar* (successive) *Dhatu* which is remained in very less quantity, thanks to

minimum quantity they're called as *kala*. From of these references, we are able to consider that *Kalas* are one amongst the essential parts of the *Dhatu*s, means *Raktadhara Kala* is one amongst the essential parts of the *Rakta Dhatu*. The activity or function of *kala* results into the formation of *Dhatu*.<sup>(9)</sup> they're minute elements and by their activity they transform *Dhatu Rasa* to respective *Dhatu*s.

### DISCUSSION

#### Description of Kala according to Sushruta

All *Acharya* have explained seven *Kalas* which is analogous to *Sushrut samhita*, but in *Sharangadhar Samhita*, location of fourth *Kala* is stated to be at *Yakrut* and *Pleeha*.<sup>(7)</sup> The body which are connected with the method of formation of the *Dhatu*s and *Malas*. One in every of the meanings of *Kala* is quality and biologically active quality of 1 *Dhatu* birth to a different type is termed as *Kala* by *Acharyas*. *Kala* is defined as a separator between *dhatu* and its *ashaya*. By definition is obvious that the *kalas* are the layers or membranes present at the junction of the *dhatu* and their *ashayas*. They're principally of seven types-

**Mansadhara Kala** – it's the primary style of *kala*. This is found inside the muscles and which allows the *siras* (veins), *snayu* (ligaments), and *dhamani* (arteries) to spread their branches inside the muscles.

**Raktadhara Kala** – it's second variety of *kala*. Which is present inside the *mansa* (muscles) within which *shonita* (blood) is present especially in *siras* (veins) localized in *yakrit* (liver) and *pleeha* (spleen).

**Medodhara Kala** – it's the third *kala*, and *med* is present within the abdomen and tiny bones of all living beings.

**Shleshmadhara kala** – it's the fourth style of *kala*. This *kala* present in synovial. This is often present altogether *sandhi* (joints).

**Purishdhara kala** – it's the fifth *kala*. It's found in *pakvashaya* (large intestine and rectum) within abdomen. This *kala* extends from *yakrit* (hepatic flexure) to whole gut or the remaining segments of huge intestine which surround other viscera's of abdomen. This *kala* separating the *kitta* and *sara bhag* right from *unduk*.

**Pittadhara kala** – it's sixth style of *kala*. This supports the four forms of food and drinks pushed out from the *amashaya* (stomach) and staying within the *pakvashaya* (small and enormous intestine).

**Shukradhara kala** – its last and seventh *kala*. This pervades the whole body altogether living beings.

#### Description of Kala in Ashtangasangraha-

*Kleda* located between *dhatu* and *ashaya*, gets matured by its own *ushma*, becomes coverings like that of *snayu*, *shleshma*, *jarayu* etc. Like *saar* (pith) of wood, it's *saar* of *datu*; however, bit of *rasa* is left within it so it's called *kala*. *Vagbhata* has mentioned *kalas* in *ashtangasangraha*.

#### Description of Kala in Bhavprakash

*Bhavprakash*'s opinion about *kala* is nearly same as that of *sushruta* and *vagbhata*; only difference is that the specificity made about *kleda*

and *ushma*. He has deviated from his predecessors by specifically stating that the *kleda* involved is of *dhatu* (located in *ashaya*) and its maturation to the shape of *kala* is achieved by the action of body heat.

### Functions of Kala

- a) Formation
- b) Absorption
- c) Protection
- d) Transformation
- e) Selection
- f) Secretion

these functions are just like the function of the cell, so we will consider *kalas* as formative elements the same as cell. <sup>(8)</sup> The *Raktadhara kala* helps in formation and transmission of blood.

### Modern View-

Actually *Kala* means differing kinds of membrane like fibrous, serous & mucous or lining, supporting & separating or fasciae, septa, sheath & capsules which covers the organ externally or internally & separates from one structure to a different. They're given names consistent with their place & function. The most function of *kala* is to holding (*Dharan*) of fundamental constitutions (*Dhatu*) to not make a number of the *Dhatu*.

Modern science has explained the various kinds of blood vessels which include artery, vein, capillary, arteriole & venues. It means a novel structure is present within all the vessels which are accountable for *Raktadhara kala*. Through exploring the anatomy of vessels we discover three distinct layers from the walls of vessels that are tunica externa, tunica media & tunica intima, in sequence from outer to inner. Since tunica externa & media aren't in direct contact with blood, so we'll not consider these layers under *Raktadhara kala*. This verse clearly indicates that *Raktadhara kala* is present within the capillaries, blood vessels & also the vascular organs. Fact, which comes out from modern literatures that, a special style of structure called sinusoids are present inside the liver & spleen in very great amount. So, the presence of sinusoids is also a reason mentioning that liver & spleen are an area of *Raktadhara kala*. Because sinusoids are a special sort of capillaries which differ from other capillaries within the body. So it should consider as *Raktadhara kala*. The wall of the human heart consists of three layer, epicardium, myocardium & endocardium. The inner lining of the center is termed endocardium & is being in direct contact with blood.

### CONCLUSION

Structurally *Kala* is often correlated with mucosa, tissue layer. *Kala sharir* gives us information about the important membranes and layers of the body which participate in many important functions of the body. As per *Ksheerdadhi nyaya* i.e. *kramaparinam* theory mentioned within the *Charak Samhita*, *Navneet* is pre sent within the milk in subtle form, its manifest only after *Uttarottar* (successive) processions. They also produce and hold the important components of the body like blood, mucous, stool etc. From above discussion, one important point will be drawn out that everyone the vessels and heart even have an analogous innermost layer which is being in direct contact with blood and could be a limiting lining between blood and vessels wall. It's called vascular endothelium. It's also present in sinusoids. Most of the sinusoids are present in liver & spleen, possibly thanks to which these are specially considered as a site of *Raktadhara kala*, so we may consider vascular endothelium as a *Raktadhara kala*.

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