

## CRITICAL APPRAISAL ON *RAKTAVAHA SROTAS* IN CONTEXT TO *RAKTAPRADOSHAI VYADHI*

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### ABSTRACT

According to *Ayurveda* entire body is made up of *Srotas* (micro and macro channels) which transports all types of materials in the body. For normal functioning of the body it is essential that these channels, both micro and macro remains intact. Detail description of *Srotas* is present in *Samhita*. *Srotas* are related with each-other, when one *Srotas* is vitiated other *Srotas* also get affected. *Srota* is the system that carries or circulates the *Doshas* and *Dhatu* or their elements to the various organs. During this process of circulation the *Dhatu* are transformed

from the first to the last (*Rasa* to *Shukra*). Each *Dhatu* has two aspects: nutrition for its own tissue layer, and sustenance for the next developing *Dhatu*. There are different numbers of *srotas* like *Rasavaha*, *Raktavaha*, *Mamsavaha* etc. which play important role in the health of an individual. *Raktavaha Srotas* is very important among the all *Srotas*. It circulates the *Rakta Dhatu* to each and every part of the body for the nourishment of every tissue. *Rakta Dhatu* gets vitiated due to imbalance of *Pitta Dosha* causing so many *Pittaj* and *Raktaj* disease conditions named as *Rakta Pradoshaj Vyadhi*. As Formation and transportation of *Rakta Dhatu* occur within the *Raktavaha Srotas*; vitiation of *Rakta Dhatu* also followed at *Raktavaha Srotas* in the form of *Sthansanshraya*. *Yakrit* and *Pleeha* are the *Moola Sthan* of *Raktavaha Srotas* which play important role in the formation and obliteration of *Rakta Dhatu*. *Vitiated Rakta Dhatu* take *Sthansanshraya* at *Raktavaha Srotas* also vitiate its *Moolasthan* result in to *Rakta Pradoshaj Vyadhi*. So there is a requirement to elaborate the knowledge of the *Raktavaha Srotas* and its *Moolasthan* with scientific way in context to *Rakta Pradoshaj Vyadhi* for the better management.

**KEYWORDS:** *Sharir, Srotas, Dhatu, Bhava Padarth, System*, micro and macro channels.

## INTRODUCTION

The *srotas* (systems) are fundamental and basic concept in *Ayurveda* unanimously accepted by all *Acharya*. *Srotas* are the main and important topic as per anatomy, because these are related with the nourishment of the different parts of the body and on other hand are important in the pathological understanding of the different diseases. *Ayurveda* is a completely practical science and for the sake of this practicality we should have a better vision about these *Srotas*. The *srotas* are enumerated with different numbers by different *acharya*. *Acharya Sushruta* has mentioned 11 pairs of *srotasa* in *Sushruta Samhita* while *Acharya Charaka* has realized the presence of 14 *srotas*. All these *srotas* are grossly classified as *Antarmukha* and *Bahirmukha Srotasa* on the basis of their external and internal appearance. *Acharya Sushruta* has defined the *srotas* in much more scientific way.

The energy required for our day to day bodily metabolic processes is been provided by the external basic factors i.e. *Prana* (Oxygen), *Anna* (food) and *Udaka* (fluid). The *Ahara* (food) is initially converted into '*Ahar-Rasa*' by *Agni* (several metabolic processes) which contain nutrients essential for the formation of *Saptadhatus* (*Rasa*, *Rakta* etc). In this process, there is also formation of excretory products like *Purish*, *Mutra* termed as '*mala*'. The homeostasis is been maintained by each and every *dhatu* by performing special type of functions such as '*Jeevan Karma*' by *rasa*, '*preenan karma*' by *rakta*. *Dhatus* and *mala* are synthesized and circulated in a specific manner in assistance with certain group of organs termed as *srotas*. *Acharya* has been elaborated this concept with respect to comprehensive and profound knowledge of its *Vyakhya* (definition), *Sankhya* (number), *Bhed* (classification), *Strotodushti Lakshans* (systemic pathological signs/symptoms) and their *Mulasthan* (origin). *Srotas* is a representative of its structural composition regarding its storage capacity and its extensibility when it matters.

### ***Raktavaha srotas in ayurveda***

In *ayurveda* the formation of *Raktadhatu* and its distribution, takes into account a group of organs involved in the process of genesis directly or indirectly. From these organs, the *Raktadhatu*, after getting originated follow certain tracts or roots to reach in the channels of greater circulation. Thus the channels carrying the *Raktadhatu* from its sites of origin to the pumping place of greater circulation and from there to each and every part of the body appear to come under the heading of *Raktavaha Srotas*. According to *Charaka*, *yakrit* (liver) and *pleeha* (spleen) is the *moolsthan* of *raktavaha srotas*. *Sushruta* also stands with the same

view with *charaka* considering the *raktavaha srotas* he has mentioned that they are of two types and regarded the *yakrit*, *pleeha* and *raktavahi dhamaniya* as a root of *Raktavaha Srotas*. *yakrit* and *pleeha* both are most important organs of the body. They are soft organs, formed from the *Rakta*, *Matrija* (maternal) in origin, place of *Ranjak Pitta*, *Moola* of *Raktavaha Srotas* etc. The blood is located in liver and spleen. The *Sara* produced by digestion of *rasa* is responsible for formation of *pleeha* and *yakrit*. *Yakrit* and *pleeha* of fetus are formed from *Shonita* (blood). The *Pitta* present in the *Yakrit* is responsible for converting *rasa* into *Rakta*. *Raktavaha srotas* are two, their root/chief organs are liver, spleen and *Raktavahi Dhamaniya*. *Ghanekar* has said that portal circulation may be taken for *raktavahi dhamani*.<sup>[1]</sup>

### ***Moolsthana of Rakatavaha Srotas***

*Srotas* is a structural and functional unit of the body through which substances flow from one part to another. Each *srotas* is said to associate with two organs which are termed as *Srotomool*. it is the most vital part of the *srotas* just like the root of the tree. In classics neither the detail description about *Srotomool* is available nor the reason mentioned for considering particular organs as the *Srotomool*.<sup>[2]</sup>

According to the *Ayurveda*, *Srotomool* is considered as the place of origin from where the particular commences or gets the nutrition. In case of *Raktavaha Srotas*, *Rakta*, is mainly produced at liver and *pleeha*; hence these are considered as the root organs.<sup>[3]</sup>

### ***Yakrit(Liver)***

*Yakrit* is the place where *Ranjak Pitta* gives color to the *Rasa Dhatu* and *Rakta* is formed. *Pleeha* is defined because it is a big storage of *Rakta Dhatu*. Just to understand what is the role of the platelets and monocytes. Platelets are important for clotting of blood. This is part of *Rakta Dhatu*.

In the early weeks of embryonic life, primitive nucleated red blood cells are produced in the yolk sac. During middle trimester of gestation, the liver is the main organ for production of red blood cells, but reasonable numbers are also produced in spleen and lymph nodes. *Acharya Sushruta* has clearly mentioned the *yakruta* is only site where production of *raktadhatu* takes place after being processed by *Raktagni* and *Ranjak Pitta*.<sup>[4]</sup>

As liver has these sinusoids and kupffer cells, it is having amazing capacity to expand. The large quantity of blood can be stored in the blood vessels of liver. Its normal blood volume

including both in hepatic veins and hepatic sinuses is about 450ml or almost 10% of body's total volume. In cardiac failure and peripheral congestion, the liver expands and 0.5 lit of extra blood is occasionally stored in hepatic veins and sinuses. About 1050 ml of blood flows from portal vein into the liver sinusoid and an additional 300 ml flows into the sinusoids from hepatic artery, the total averaging 1350 ml/minute. This amounts 27% of resting cardiac output. Both these capacities of liver i.e. storage and inflowing with regards to the blood have very strongly mentioned by *Acharya Sushruta*. He has quoted the *yakruta* as *Raktashaya* by only realizing its above described properties. Also he has introduced the liver as a *Sthana* of *Raktadharakala* which means a special type of membrane. The endothelial cells, kupffer cells lined internally to the sinusoids are the membrane like structures which may be considered as *Raktadharakala*. Except for the iron in the haemoglobin of blood, by far the greater portion of iron in the body is stored in the liver in form of ferritin. The hepatic cells contain large amount of proteins, apoferritin which is capable of combining reversibly with iron. Therefore, when iron is available in the body fluid in excess quantities, it is stored in the liver in the form of ferritin in hepatic cells until needed elsewhere. When iron circulating in the body reaches a low level, ferritin releases the iron. Thus the liver act as blood iron buffer as well as iron storage medium.<sup>[5]</sup>

### ***Ranjaka Pitta***

The fire that imparts color. It is located in the liver, spleen, stomach and small intestine, and gives color to the blood, bile and stool. It is primarily resides in the blood and is involved in most liver disorders. It is involved in the creation of red blood cells (RBC), so a dysfunction of *Ranjaka* may cause anemia.<sup>[6]</sup>

### **Pleeha(Spleen)**

It is the main organ where platelets are stored. According to modern physiology, red blood cells are manufactured in the bone marrow. *Ayurveda* has not given any reference of that. Rather, *Ayurveda* says that up to a specific age the sternum is the place where the *Rakta Dhatu* is prepared. And in modern physiology, there has been notice made that up to a certain age, the sternum bone marrow specifically plays for the development of red blood cells. That reference is also in the *Samhita*.<sup>[7]</sup>

The spleen is an organ in the upper far left part of the abdomen, to the left of the stomach. The spleen varies in size and shape between people, but it's commonly fist-shaped, purple, and about

4 inches long. Because the spleen is protected by the rib cage, you can't easily feel it unless it's abnormally enlarged.

The spleen plays multiple supporting roles in the body. It acts as a filter for blood as part of the immune system. Old red blood cells are recycled in the spleen, and platelets and white blood cells are stored there. The spleen also helps fight certain kinds of bacteria that cause pneumonia and meningitis.<sup>[8]</sup>

### ***Raktavahini Dhamani***

These are the arterial vessels or blood vessels. *Dhamani* means only arteries. Separate terms used for arteries and veins. *Dhamini* means "which pulsates" – so arteries are pulsating blood vessels.

It can be considered that, all above explained *moolasthan* are local controllers of their corresponding *srotas*. The two centers each mentioned as *moolasthan* in context of one *srotas*, primarily controls the activities of their corresponding *srotas* only. But there might be a super or unique controller who controls *moolasthan* of all *srotas*. *Suhsruta* had used the word *dhamani* to some of the *moolasthana* of *srotas*, but he had not used any *sira* as the *moolasthana* of a *srotas*. It is sure that *dhamani* can only act as *moolasthana* but not the *sira* because they carry deoxygenated blood and they are situated after the *srotas* so they cannot become as *moolasthana* of any *srotas*. He had not considered *dhamani* as *moola sthana* of the following *srotas*, they are *Udakavaha*, *Medavaha*, *Mutravaha*, *Sukravaha* and *Purishavaha Srotas*, the reason may be that these *srotas* may not be related directly with any *dhamani* and some of them are *mala* so they not require any *dhamani* to the *moolasthan* of these *srotas*. But when we look as per the modern view the formation of *mootra* takes place by filtration from the capillaries only but still he had mentioned *dhamani* which lie before these capillaries because the concept of *mootra* formation as per *ayurveda* is different from the modern science.<sup>[9]</sup>

### ***Trividh Pariksha of Raktavaha Srotas-***

<b><i>Darshana</i></b>	<b><i>Sparshana</i></b>	<b><i>Prashna</i></b>
Cyanosis, Pallor, Icterus, Hyper pigmentation, <i>Rakta twak &amp; netra</i> , Inflammation in <i>Guda, Medra &amp; Aasya</i> . Look for skin diseases like <i>Kusta, Visarpa, Pidaka, Switra, Pama, Kota, Vidradi &amp; Asra mandala</i> etc.	Palpation of Liver & Spleen <i>Rukshata</i> Increased <i>Ushnata</i> .	Ask for <i>Asruk dhara</i> .  <i>Aamla shishira preeti</i>

## DISCUSSION

Human body appears to be conglomeration of Srotas (channels) and proper functioning of these channels is the cause of good health. The food and regimen that promote morbidity and go contrary to the well-being of dhatus (tissue elements) vitiate channels. Affliction of these channels leads to the vitiation of tissue elements residing there or passing through them, as vitiation of one leads to the vitiation of another. The vitiated channels and tissue elements vitiate other channels and tissue elements respectively.

The liver is a large, meaty organ that sits on the right side of the belly. Weighing about 3 pounds, the liver is reddish-brown in color and feels rubbery to the touch. Normally you can't feel the liver, because it's protected by the rib cage.

The liver has two large sections, called the right and the left lobes. The gallbladder sits under the liver, along with parts of the pancreas and intestines. The liver and these organs work together to digest, absorb, and process food.

The liver's main job is to filter the blood coming from the digestive tract, before passing it to the rest of the body. The liver also detoxifies chemicals and metabolizes drugs. As it does so, the liver secretes bile that ends up back in the intestines. The liver also makes proteins important for blood clotting and other functions.

The destruction of old red blood cells produces waste that gives fecal matter its usual brown color. Discoloration of stool — or darkened urine — could signal the onset of problems within the liver, such as viral hepatitis. Another common sign of liver problems is jaundice, the yellowing of the skin and eyes due to the buildup of bilirubin, a waste product of normal hemoglobin breakdown. Your liver plays a vital role in fighting infections, particularly infections arising in the bowel. It does this by mobilizing part of your body's defence mechanism called the macrophage system. The liver contains over half of the body's supply of macrophages, known as Kupffer cells, which literally destroy any bacteria that they come into contact with. If the liver is damaged in any way its ability to fight infections is impaired. The spleen is composed of two primary regions namely, red pulp and white pulp. The red pulp makes up for little more than three-fourth of the spleen. A region designated marginal zone is a transition area that separates it from the white pulp. Red pulp is red because it has many small cavities (sinusoids) where the spleen stores blood in case of injury or other situations where the body needs extra blood. This blood reserve has a high count of platelets,

an essential component for blood coagulation to help stop bleeding. Red pulp also removes and recycles components of old, damaged and dead red blood cells. White pulp is associated with the lymphatic function of the spleen. Most of this tissue consists of lymph-related nodules, called Malpighian corpuscles. The white pulp works as part of the immune system, producing antibodies (immunoglobulin) that recognize and neutralize harmful antigens (bacteria and viruses) in the blood. It also produces and stores white blood cells (lymphocytes).

## CONCLUSION

The way of Ayurveda has explained and described the concept of *Raktavaha srotas* and its *Mulasthana* is purely in a functional manner.

*Ayurveda* has not explained the liver functions in details but inspite of that mentioning of *yakruta* as a *Mulashtana* of *Raktavaha Srotasa* correlates with modern functions of liver. Efficient *Vaidya* is one who starts the *Chikitsa* after doing the *pareeviksha*. A complete knowledge of *Raktavaha srotas* is a must for an *Ayurvedic* physician to approach a patient in a holistic way. Manifestation of a disease occurs in the body as a result of the defective *Raktavaha srotas* of the body.

So any defect of *Raktavaha srotas* must be corrected quickly for the restoration of normal health from *Raktapradoshaj Vyadhi*.

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