



Review Article

ISSN 2320-4818

JSIR 2017; 6(1): 33-37

© 2017, All rights reserved

Received: 10-01-2017

Accepted: 06-02-2017

Dr. N.K Dadhich

Assistant Professor, Department of Kriya Sharir, SKD Government Ayurvedic College & Hospital, Muzaffarnagar, UP-251001, India

Dr. Pooja Sharma

MD Scholar, PG Department of Kriya Sharir, Jammu Institute of Ayurveda & Research, Jammu, J&K- 180001, India

Correspondence:

Dr. Pooja Sharma

MD Scholar, PG Department of Kriya Sharir, Jammu Institute of Ayurveda & Research, Jammu, J&K- 180001, India

A plenteous view on Rasavaha Srotas with cardio vascular system

N.K Dadhich, Pooja Sharma*

Abstract

Srotamsi stands for the inner delivery system of the body incorporation to that of circulatory system. It indicates all level of exchanging and transportation of Posahya Rasa from Ahara Rasa at micro to macro level of cells and tissue. Srotas carry all like Posahya Rasa to Poshaka Rasa, specific materials, hormones, enzymes, thought process, stimulus. It is such a minute supply that is not seen but visible by their action or by functioning that occurs. As in texts Dhamni and Sira are more resembled with Srotas by functioning level as of transportation but these three are different from each other. In this article I try to opt on Rasavaha Srotas in detail view and resemblance with cardiovascular system.

Keywords: Srotas, Rasavaha Srotas, Samvahana, Hridaya, Cardio vascular system, Circulation ease.

INTRODUCTION

Ahara Rasa is the extract juice of Vijatiya Aana (foreign diet). Rasa Dhatu is the first Dhatu which gets formed from the Ahara Rasa i.e. nutrient portion of food after proper digestion of food by the Kosthagni (digestive fire in Kostha). It circulates throughout the body carrying Posakamsas (nourishment part) to the remaining Dhatus. The organs and channels through which this Rasa Samvahana (circulation) takes place are collectively termed as Rasavaha Srotas and include the following –

Hridaya (heart), Sira –Jala (net work of veins), Dhamani Jala (net works of arteries), Rasayni Jala including the Lasika Granthis (net work of lymphatis).

Acharya Charaka mentions Hridaya and the ten Mula Dhamanis (great vessels) as the Mula (chief organs) of this Srotas.^[1] In text these mentioned as under Marma i.e. vital supplier or organ for body.

CONTEXTUAL PART-

Related with Rachana Sharira-

Hridaya- is an organ made up of Mamsadhatu, having the shape of a lotus bud held upside down, located in between the two Puppusas/lungs inside the chest just beneath the Urasthi/sternum slightly to the left of the middle line, its lower tips/ apex about 1” below the left nipple. The entire organ is covered with two layers of Snayujakalas-the Hridayavarana Kala/ pericardium. In between the two layers, there is a small amount of thin fluid to help its free movement.

With its bag, the heart measures 6” in length, 4” in breadth, 3” in thickness and weighs about 200-300 gms, in an adult. Hridaya is a hollow organ having 4 compartment viz, the two Hrtkarnas/ right and left auricles and two Hrtkukis/ right and left ventricles- Hrtkarnas being the upper cavities and Hrtkukis the lower one each on either side. The two halves /right and left of the Hridaya are separated by a thick band of Mamsa while, in between Hrtkarnas and Hrtkukis, there are Kapatatas / Valves with two Patras/ cusps on the left side and with the three on the right. These Kapatatas/ valves allow anything from above downwards only, but not in the reverse direction.

Hridaya is connected with the main trunks of Dhamanis and Siras / Mula. The Uttara and Adhara Mula Siras / Mula. The Uttara and Adhara Mula Siras / SVC and IVC join the right Hrtkarna / right auricle and empty their connects- Rasa-Rakta brought from all over the body. The two Mahasiras from the

Puppusas/ pulmonary veins bringing blood from the lungs into the heart join the left Hrtkarna / left auricle and empty their contents into it. From the right Hrtkuksi / right ventricle arises the main Puppasabhi Sira / pulmonary artery which, dividing itself into two, carries Rasa-Rakta to the two Puppusas. From the Vama Hrtkuksi / left ventricle arises the main trunk of Mahadhamani /Aorta, which arises upwards, takes a curve above the Hrdaya and descends down into the abdomen. At the root of this Muladhamani, two branches arise from it at the level of its bend on either side of its neck, which supply Rasa-Rakta to the Hrdaya itself known as Hrtposini Dhamani / coronary arteries. All along their length, the Dhamanis go on giving out small branches, the terminal branches / arterioles being as small as cannot be seen by the naked eye. These terminal branches of Dhamanis / arterioles fuse with similar terminal branches of the Siras / venules at the level of the Dhatus/ tissue. These terminal Siras, in their turn, join bigger Sira / veins. Thus two Jalas / net work, one each of Dhamanis and Sira are spread out all over the body.

In addition to these two, there is still one more the Rasyani Jala/ lymphatic network innumerable minute tubes of varying lengths, white in color, spread out all over the body, they are connected with small Granthis/ lymph Glands in between and finally join the main trunk of veins inside the chest, at the level of the neck and empty their contents into them. These, Granthis, called Lasika Granthis/ lymph gland are smooth, soft and are of the size of grapes. Even though present all over the body they are found in bunches in the Griva/ neck, Karnamula/ back of the ears, Kaksa/ axilla, Uras/inside the chest, Udara/ inside the abdomen, Vankshana/groin, etc. The Rasyani Jala is again of two kinds-lacteals/ Payaswini Jala comprising of Rasayanis arising from the walls of the Antras/ intestines which fuse into two medium sized channels, the right and left Rasakula/ lymphatic ducts, the left one being bigger, Called as Mukhya or Pradhana Rasakula/ thoracic duct. Payaswinis are so called, because they collect from the intestines the Payasa Rasa /chyle which is a portion of Ahara Rasa, they purvey half of this fluid to the Yakrit / liver, to be converted into Rakta blood formation, the other half is poured directly into the Sira. And other on is Laskia Jala / lymphatic vessels is the net work of channels situated beneath the Twaka/ skin, connected in between with Granthis called /more appropriately as Laskia Granthis. This net work also joins the main veins inside the chest and pours contents into it.

The Dhamani jala appears red in color the Sira Jala blue and Rasayani Jala /lymphatic is white. That is the major difference in this three Jala.^[2]

Related with Kriya Sharira

Ahara Rasa or the nutrient portion of properly digested food^[3], after being absorbed from the intestines by the Payaswini/lacteals gets divided into two portions, one portion reaching Hrdaya by way of the vein at the root of the neck; the other portion being conveyed to the Yakrit/liver where it is acted upon by Ranjaka Pitta, gets converted into Rakta and reaches the Hrdaya later on to join the Rasa.^[4] So Rasa and Rakta Dhatus are always found to be circulating together, the Rasa portion being watery carries with it the Rakta which is slightly thicker. In modern parlance, the fluid portion of blood called the plasma is comparable to Rasa Dhatu & the formed element portion to Rakta Dhatu. So, this Rasa cum Rakta has the Posakamsa/ nutritive elements required for all the Dhatus of the body & supply them during its circulation / Rasa Samvahana. Hrdaya plays the most important role in circulation-the Sankocha /contraction & Vikasa / expansion of the four compartments of it providing the propelling force. The nature of heart's action or Hrtarya Chakra/ cardiac cycle can be described as like-

Rasa –Rakta from all over the body is poured into the Daskshina Hrtkarna / right auricle by the two Mula Siras /SVC & IVC while at the same time the Vama Hrtkarna /left auricle also gets filled with Rasa – Rakta coming from the two Puppusas. When both Hrtkarnas are thus filled with Rasa cum Rakta, they undergo Sankocha /contraction forcing the fluid into the two lower Hrtkukis /ventricles through the Kapatas/valves present in between. When the Hrtkukis get filled up, they also undergo Sankocha, forcing out the fluid present in them; the Dakshina Hrtkuksi /right ventricle into the Dhamani/pulmonary artery which takes the Rasa cum Rakta to both the Puppusas while the Vama Hrtkukis /left ventricle forces its contents into the Arohima Dhamani - Ascending Aorta, to be circulated all over the body.

Sankocha / contraction = systole of the chambers of the heart is followed by their Viaksa / expansion = diastole; in between them there is a very short period of rest to the heart. The wave set up by the powerful contraction of the Hrtkuksi is conveyed even to the minute branches of the Dhamanis/ arteries and can be felt by placing the fingers over them. This is called Dhamana or Spandana /pulsation & its examination is called Nadipariksha / examination of the pulse and will be described in detail under Astasthana Parisa in Charaka.

Hrdaya Kriya starts by about the middle of the fourth month of foetal life and continues without break till death. So long as there is heart's action there is life, and life becomes extinct when the heart stops. Hence Hradya is described as the chief Pranayatana/ seat of life & any deformity in its function is sure to give rise to alarming distress. It is also described as Marma / vital spot belonging to the group of Sira Marma /vital spot belonging to the group of Sira Marmas. The Hrt Vega / heart rate varies greatly according to the age, being more in childhood, less in old age and average 72 /minute during adult life.

With the contraction /systole of the left ventricle about 60-70 cc of blood is forced in the Aorta. The resulting pressure travels as a wave throughout the arterial system & is called the Blood Pressure. After the contraction follows the expansion /diastole of the ventricle when the pressure slightly falls this also can be recognized. The systolic pressure ranging between 90-120 mm/hg reflects the dispensability of the arterial system whereas as the diastolic pressure ranging between 60-80 mm/hg represents the capacity of the ventricle to contract and the resistance it has to overcome to throw open the aortic valve.

The function of Sankocha and Vikasa of the heart is attributed to Pranavata whereas the function of Rasa Samvahana/ circulation of Rasa-Rakta all over the body are considered as due to Vyanavata.^[5,6]

The Rasa cum Rakta after being forced into the Dhamanis circulates through all the Dhatus. At the level of its terminal branches much of the watery portion oozes out & the Sukshma Srotas of Dhatus take them up as nutrition for the Dhatus. The Dhatuvaha Srotas transforms this Rasa, by the action of their specific Dhatwagnis and make the nutrient material suitable for them. During this process of transformation / Dhatwagni Paka metabolism certain waste products /Malas are also produced. The terminal branches of the Siras /venules & the Rasayanis/ lymphatics absorb or collect the fluid thus oozed out from the terminal Dhamanis, which is now devoid of Sara / Nutrient materials but mixed with Dhatu Malas, tissue wastes and carry them to the Hrdaya. Hrdaya is also the seat of Para Ojas which, in spite of its small quantity / only about 8 drops, exercises great influence upon the action of the heart; its decrease in quantity bringing about signs of Hrt-Stambha /heart failure, while its increase is considered to promote good health and happiness.^[7]

Sroto Dusti Karana-

AHARA	VIHARA	MANSIKA
Food which are At-Snigdha, Atisita, Swadu, Amla, katu, Madura, Guru, Adhyasana, Visamasana, Anasana/ Malnutrition.	Atimadyapana, Tamabaku Sevana, frequent hot drinks like coffee & tea, Avyayama, sweet & fatty foods, over eating, lack of exercise, use of tobacco and alcohol, mental emotions have been the most important causes in the present day. Heart diseases are seen more in civilized societies and advanced countries. use of white sugar, meat, marrow, animal fats, ice-cream etc. have proved to be causes of heart attacks.	Udwegas /mental emotions like Krodha/anger, Irsya/ jealousy, Bhaya /fear, chinta/ worry, disappointment, frustration, social ill-adjustment etc. VISISTA VYADHIS OF OTHER ORGANS- Puppusa Roga, Vrkka Rogas, Amavata, high BP, Surgical operations and oushadha. Sahaja Vikritis.

Dosha Vriddhi Lakshanas-

VATA	PITTA	KAPHA
Hrdaya- Hrddrava –increased rate	Hrddrava	Hrddrava
Hrd Stambha	Hrd Sopha	Hrd Ayama
Hrt sula	Hrd Avadarpana	Hrd Gourvta
Hrt Sunyata		Hrdayotkleda
		Hrd Stambha/congestive failure
Kapata Vikrtis/valvular dislocations		
Sahasa Marana/quick death		
Dhamanis and Siras		
Kathinya/hardness inside	Ati Mardava/increased softness	Marga Sankocha
Twaka & other Dhatus, Ruksata	RaktaSrava	Ati Snigdha
Karsya	Daha	Sotha
Duschaya	Trsa	Saitya
Manasika Lakshans	Usma Vriddhi	Gurutwa
Marana Bhaya	Pralapa	Praseka
Sabda Ashahisnuta, Moha, Murcha, Samjna Nasa/unconsciousness.	Moha, Murcha/convulsions.	Kasa, Swasa, Tama, Ati-nidra, Alasya, Tripti.

Vridhi/Kshaya Lakshana of Rasa Dhatu-

The effect of Rasa Vriddhi, Rasa Ksaya and Ojas Ksaya are clearly discernible in all the organs of this system and so have to be carefully noted. Some important Lakshanas are tabulated [8]-

RASAVRDDHI	RASAKSHYA	OJASKSHAYA
Hrdaya Hrd Ayama/ dilatation	Hrd Sankocha/atrophy	Kriya Nirodha
Hrd Gaurava	Hrd Sunyata	Hrd Stambha
Hrd Drava	Hrd Tama, Hrd Kampa, Hrd Drava, Hrt Sula.	Vegakshya
TWAK & DHATUS		
SwetaVarna	Ruksata	Duchchaya, Gatra Sada
Saitya		Gurugatrata
Sotha		Mamsaksaya
Gurugatrata		
Siras and Dhamanis	Riktata, Saithilya	
Kathinya, Ayama, Granthi, Vidirna		
Manasika Lakshana		
Alasya, Atinidra	Tama, Nidranasha, Sabda Asahisnuta	Bhaya, Adhyana, Tandra, Nidranasha, Murcha, Moha, Pralapa, Samjna Nasa
Any Lakshana		
Praseka	Trsna	Ati Dourbalya,
Kasa, Swasa		Mama

Rasavaha Srotas Pariksha-

The organ to be examined are- the Hrdaya, Dhamanis and Granthis and Lasika, Lasika Siras Vahinis. Of these examination of the Hrdaya is the most important.

Hrdaya Pariksha is to be carried out in respect of its-Sthana and Akrti, Vega and Spanada, Sabda.

Examination of Lasika Granthis and Lasika Vahinis-

Production of Ahara Rasa which is normal both in its quantity & quality depends upon the normalcy of Kostagni. If the Kostagni is abnormal, the Ahara Rasa & Rasa Dhatu will both be produced in a bad state as follows: the Kostagni if Tikshna /hyper active the food undergoes Dagdha Paka/charring, all the nutritive materials are overburnt leading

to production of Ahara –Rasa which is poor both in quantity & quality. The Rasa Dhatu that gets formed from such an Ahara Rasa will also be naturally poor. This condition is called Rasa Kshaya. If, on the other hand. The Kostagni is Manda /inactive the food does not get the required digestion leading to accumulation of Ama or undigested food/materials; these undigested materials tend to accumulate in the Ahara Rasa produced at the end of digestion. The Rasa-Agni will be unable to transform these unprocessed Amadravyas, thereby leading to the production of Rasa Dhatu which contains large amount of Ama/ Sama Rasa, making it to increase in its quantity / Rasa-vridhi only, but remaining poor in quality. This Sama-Rasa begins to circulate all over the body through Dhamani, Sira and Rasayini Jalas/ arterial, venous and lymphatic networks, as well as the Dhatus/ tissue poses. During its sojourn in these channels, it tends to adhere to the walls, thereby narrowing the passages or causing obstruction to them, /Srotorodha, obstruction leads to accumulation of excess materials inside the Dhatus which, in turn, grow in size/ Dhaturvrdhi abnormally. Thus both Rasaksaya & Rasavrdhi are to be considered as Vikrta or abnormal, the former leading to Ksaya/ decrease, wasting of the Dhatus by accumulation within the Suksma Srotas of the Dhatus.

Other Vikriti of Rasa Vaha Srotas-

As mentioned Vriddhi & Kshaya other disorders of plasma circulation are-

-Increase in its water content- Jaladhikya Rasa – hydraemia, hydropsy.

-Decrease in its water content- Jala Ksaya- anhydraemia, dehydration.

Increase in its alkaline/salts- Lavanadhikya Rasa /alkalemia, alkalosis.

Increase in its acids- Amladhikya Rasa/ academia, acidosis.

Increase in its calcium content- Sudhaadhikya Rasa /hyper-calcemia

Decrease in its calcium content- Sudhalpa Rasa/hypocalcemia.

Increase in its sugar content- Madhuradhikya Rasa/ hyper-glycemia

Decrease in its sugar content-Madhuralpa Rasa/ Hypoglycemia

Decrease in its protein content- Madhuralpa Rasa / Hypoprotinaemia

Increase in its fats content- Medasadhikya Rasa lipaemia.

Accumulation of cholesterol- Snehadhika Rasa/Hyper-cholesteromia

Accumulation of bile pigment- Pittayukta Rasa Dhatu/bilirubinaemia

Accumulation of Haemoglobin-Raktamisrita Rasa/ureamia

Accumulation of urea,uric acid etc- Mutramisrita Rasa/ ureameia

Accumulation of Melanin and other pigments- Varnadravyayuktarasa/ Melanaemia

Accumulation of living organisms-Krimiyukta Rasa / bacteriemia, septicemia

Accumulation of pus-PuyayuktaRasa/Pyemia

Accumulation of bacterial toxicants –endogenous or exogenous Ama-Visayuktha Rasa/ Toxemia

Each one of the above produces many signs and symptoms and is seen in many diseases. Recognition of these is possible by observing the symptoms or by laboratory tests or both.^[9]

DISCUSSION

The Rasavaha Srotas is the main Srotas or called as First Srotas that supply major to minor Nutrients to all parts of the body circulation. Rasavaha Srotas mainly give Poshana to Rasa Dhatu as well as Rakta Dhatu under this Srotas Hrdaya and Yakrit are come because Ahara-Rasa Poshanta first goes to Yakrit and then to Hrdaya and then it will circulate all to body parts with lungs, it is proved in this above article. Ojus or final product of Dhatus are indirectly ponders on Rasavaha Srotas or Ahara Rasa that it circulates its quantity decrease or Ksaya due to many causes. The more important ones being-1- Abhighata/injury to Hrdaya, 2- Dhatu Ksaya due to any cause, 3- Atishrama-Physical exertion, 4- Ksudha- starvation over long periods, 5- Visa Sevana – ingestion of toxic substances like coffee, tea, opium, arsenic, alcoholic drinks and other poisonous drugs, animals poisons etc. 6-Manasika Vikritis like Ati Krodha/anger, Soka/grief, Dhyana/ worry, etc, & 7-Bhutabhisanga bacterial infection and infestation by demons and evil spirits etc.^[10] Ojaksaya are linked with its abnormal supply that leads to Oja Visramsas, Vyapti, Ksaya.

CONCLUSION

Rasa Dhatu is one of the important Dhatu and that of Rasavaha Srotas is important circulation. This concept in Ayurveda exactly resembled with modern functions of heart and somewhat of liver. Ayurveda describes scientifically the concept of Rasadhatu in precursor of Raktadhatu. Blood circulation depends upon fluid level in the blood. Fluid level, osmotic pressure is influenced by blood plasma protein level. The Mulasthanas of Rasavaha Srotas is 10 Dhamani and Hrdaya and that of modern to main artery and heart.

Scope for further study

This study of Rasavaha Srotas with CVS are to be studied again in detail with more symptoms and signs taking these as starting point will help to promote this theory so that further CVS disorders are to be cured as taking the principle of Nidana Parvarjana as mentioned in Susurta Samhita.

No conflict of interest: Nil

Financial assistance: No

REFERENCES

1. CharakaSamhita, Vimana Sthana, Chapter-5, verse-8, SashtriKashinathPt, ChaturvediGorakhnathDr ., ChaukhambaBharti Academy; 2004, Varanasi.
2. SusrutaSamhita edited by KavirajAmbikadattaSastri,SutraSathana, chapter 14/26, on Dalhana Chakhamaba Sanskrit Sansthan,Varanasi,2007, P- 61
3. SusrutaSamhita edited by KavirajAmbikadattaSastri,SutraSathana, chapter 14, Chakhamaba Sanskrit Sansthan,Varanasi,2007, P- 61
4. SusrutaSamhita edited by KavirajAmbikadattaSastri,SutraSathana, chapter 14/3-6, Chakhamaba Sanskrit Sansthan,Varanasi,2010.
5. Charaka S, SashtriKashinathPt, ChaturvediGorakhnathDr ., Chikitsasthana, Chapter-15, verse-28 Varanasi: ChaukhambaBharti Academy; 2004.
6. SusrutaSamhita edited by KavirajAmbikadattaSastri,SutraSathana, chapter 46/528 Chakhamaba Sanskrit Sansthan,Varanasi,2007,
7. CharakSamhita, with CharakChandrika Hindi commentary, by Dr. BrahmandTripathi and Dr. Ganga SahayPandey, Sutra Sthana Chapter 17, verse-14-15, ChaukhambaSurbharti Prakshan,2007.
8. SusrutaSamhita edited by KavirajAmbikadattaSastri,SutraSathana, chapter 15/13-19 Chakhamaba Sanskrit Sansthan,Varanasi,2007.

9. CharakSamhita, with CharakChandrika Hindi commentary, by Dr. BrahmandTripathi and Dr. Ganga SahayPandey, Sutra Sthana Chapter 17, verse-16-17, Chaukhambha Surbharti Prakshan,2007.
10. CharakSamhita, with CharakChandrika Hindi commentary, by Dr. BrahmandTripathi and Dr. Ganga SahayPandey, Sutra Sthana Chapter 17, verse-16-19, ChaukhambhaSurbharti Prakshan, 2007.