

**STUDY OF PRANAHA SROTAS WITH REFERENCE TO MODERN ANATOMY****Dr. Ramesh Kumar*, Dr. Dinesh Choudhari and Dr. Rajshri T Shilimkar**

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ABSTRACT*Pranavahe dwe tayormoolam hridayam rasavahinyaschya (pranvahinyashchya) dhamanya:*

Su.sha 9/12

*Tatra pranavahanam srotasam hridayam moolam mahasrotasam ch
Rasavahanam srotasam hridayama moolam dasa cha dhamanya.*

Cha. Vi. 5/7

Sharir Rachna is basic subject of medical science. Hence concepts of sharir should be cleared. Ayurveda gives various ideas of sharir, which should be explained on the modern basis. Srotas is one of Ayurvedic terminology & basic thing of Ayurveda, but is should be cleared to ayurvedic students. Acharya Charak had explained srotas as medicinal view while acharya sushrut had explained srotas according to surgical aspect. Pranavaha srotas is first & important srotas, which carry pran all over body. By studying this srotas mulasthan, vidha lakshanas & vahana, also by studying concern reference regarding pranvaha srotas, respiration, etc, idea of this srotas is explained, how it is related to respiratory system & internal & external respiration is elaborated in this article. It will be helpful to ayurvedic students to clear ideas regarding srotas as well as pranvaha srotas. How pranavha srotas related to heart, lungs and other structures like pulmonary artery and pulmonary vein is elaborated in this article.

KEY WORDS: Pranavaha srotas, prana, respiration, srotas, lungs, oxygen.**INTRODUCTION**

Sharir Rachana and Sharir Kriya are two sides of coin. Ayurveda never given separate Sharir Rachana or Anatomy and Physiology or Sharir Kriya. Anatomy is well mentioned with physiology, pathology, surgery or medicine. We must to know basic things or anatomical concepts. Now in globalization of world these concepts should be clear on the modern basis. Srotas is one of the major anatomical concept of Ayurveda.

It is said that 'sroto aium purusha' that means human body is made up of so many srotas, but for clarification and under standing various functions o srotas are mentioned by Acharya Sushrut and Charak.

Definatoin of Srotas

A channel that transport only dhatu under metabolic transformation is called srotas.

There are a many number and types of srotas mention by different authors.

Each srotas is attached to a specific anatomical structure called Moola Sthana.

As per Acharya Sushrut- A srotas is tubular structure or organ which initiate the flow of the fluid material from the inner of the body to its outer opening.

SU.SHA. 9/13

As per Acharya Charak- There are srotas as much organs are there in our body.

CHA.VI. 5/2

Panchabhautikatva of srotas (Constitution): Srotas are Panchabhautik with predominans o akash mahabhoot.

Utpatti of Srotas

In intrauterine life, due to pradhmana (movements) of vayu in embryo (pittadwara pachit mansakhanda) srotas are produced.

Functions of srotas

SRAVAN (Secretion)

PARINAMANA (Reproduction and Recycling)

UTSARJANA (Excretion of Waste Products)

The normal functioning of the particular srotas is depends upon its moolasthan. Any abnormalities in these in these peripheral srotas ultimately can affect the moolasthan of SROTAS.

Types**AS PER CHARAKA**

- A) Bahirmukha srotas-9
- B) Antarmukha srotas-14

AS PER SUSHRUTA

He stated 11 pairs that is 22 srotas.

He had not consider Asthivaha, Majjavaha and swedvaha srotas.

Because these are sarvashahir vyapi (involved all over body).

Acharya Charak and Acharya Sushrut both give first priority to pranavaha srotas. Sushrut gives clear idea regarding prana, agnisomvayu satvarajatama, panchendriya bhutatmethi prana” He says that agni, soma, vayu satwa, raja and tama and also panchgyanendriya are pranas because due to these vital factors signs of aliveness is seen. One more important definition is pranaha vahaniti prana means:

The chaitnya or jivana giving matter is pran. The vahan or transfer or conduction of this prana through all structures of the body is called as pranvaha srotas. The factor which gives life to body is called as prana. Oxygen is very important factor for life process which is inhaled by respiration. And the srotas which carry this prana is called as pranvaha srotas and the system which supplies oxygen is called as respiratory system.

“Nadya panthano margaha sharir chidrani “ Acharya Charak has given various synonyms of srotas that are sira dhamani rasayani, rasavahini, nadi, path, sharirchidrani, niket but he mentioned important thing is nadi or tube like structure, path or marg means special way for special matter, sharirchidrani means vacuoles of body: these structures are specially called as srotas.

MATERIALS AND METHODOLOGY

Respiratory system or mamilian airway is formed by nose, nasal cavity, pharynx, larynx, trachea, bronchus, bronchioles and finally alveolar sac. This sack is surrounded by capillaries and vessels.

As air inhaled through the upper airway filtered in the nose heated to body temperature and fully saturated with water vapors, partial recovery of this heat and moisture occurs on expiration. Then air goes to glottis and glottis to trachea, major bronchus, secondary; tertiary bronchioles and alveoli The acinus is gas exchange unit of the lung and comprises branching respiratory bronchioles and clusters of alveoli here filtered moistures heated air makes close contact with pulmonary capillaries and oxygen up take and carbon dioxide excretion occurs the alveoli lined with flatted epithelial cells.

The gas exchange of oxygen and carbon dioxide are purely passive no ATP is consumed they depend on

behavior of gases described in daltons law and henry law.

Transport of gases between lungs and body tissue is function of blood, when oxygen enters the blood certain physical and chemical changes occurs that aids in gas transport and exchange.

Oxygen does not dissolve easily in the water therefore very little oxygen only 1.5% is carried in the dissolved state in water blood plasma and remained oxygen 98.5% is transported as chemical combination with hemoglobin inside RBC. Each 100 ml oxygenated blood contains about 20 ml of oxygen and 0.3ml dissolved.

The change of respiratory gases between lungs and blood takes place by diffusion across alveolar and capillary walls. Collectively the layer through which the respiratory gases diffuse are known as alveolar capillary membrane.

The heart act as two separate pumps operating side by side. The right heart generate circulation to lungs and left heart feeds rest o body. The right atrium drains deoxygenated blood from superior and inferior vena cava and discharges blood in to left atrium and in to left ventricle through bicuspid valve.

“Tatra pranvahanam hrudayam mullam mahastrotasam khavisheshmedh Vishehsh bhavati charak”

When this srotas is not working properly then special signs and symptoms or seen more expiration rate, whising sounds at the time of respiration, painful breathing and tightening of chest also seen. Sushrut commentator Dhalan says that “*Tatra vidhasaya kroshanavinaman mohan bramhan vepenani maranam vaa bhavati*”.

When this srotas hampers then following symptoms are seen croshan means to cry, winaman means bending forward, bramhana means vertigo, mohana means unconsciousness, vepenani means tremors of the body and lastly death occurs.

DISCUSSION

As we seen that pranvaha srotas is first srotas of the body. Srotas concept is based on following four main qualities.

1. To produce specific bhava or matter that means utpatti of bhav.
2. To transfer or to carry these bhava from one place to another place means vahana of these bhavas.
3. To secreate these specific bhava means stravanath srothansi. Specific root or marg of these bhava. Some srotas has all four qualities but some has one quality out of four the structure used for above functions. These structures are like ducts, tubules, blood vessels, capillaries, organs and ashaya. Srotas is decided according to transfer of matter through it

and it is related to its mulsthana. Charak and sushrut gives there mulsthana according to their function or storage of bhava or relay center of bhava. Second mula is considered as conducting system off these bhava.

In case of pranavaha srotas air entered from external nares to pharynx, larynx, trachea and right and left bronchus and then bronchioles and finally to alveoli. This is the path of oxygen.

In this way external atmospheric oxygen is reaches to lungs. In alveoli gas exchange process of oxygen and carbon dioxide takes place. This is purely passive process, hence no ATP is consumed. Transport of gases between lungs and body tissue is physical and chemical process. The exchange of respiratory gases takes place by diffusion method across alveoli and capillary walls.

Oxygen does not dissolve easily in the water therefore very little oxygen only 1.5% is carried in the dissolved state in water blood plasma. And remained oxygen 98.5% is transported as chemical combination with hemoglobin is transported in chemical combination with hemoglobin inside RBC. Each 100ml oxygenated blood contains about 20 ml of oxygen and 0.3ml dissolved.

Hemoglobin consists of protein portion called globins and an iron pigment called heme. Each hemoglobin molecule has four heme group can combined with one molecule of oxygen. Oxygen and hemoglobin combine in an easily reversible reaction to form oxyhemoglobin since 98.5% or oxygen is bound to hemoglobin and trapped inside RBC only 1.5 can diffuse out tissue capillaries into tissue cells.

When we think sharir rachana & sharir kriya regarding pranavaha srotas. Ancient scholar never given separate sharir rachana & sharir kriya. Anatomy is well mentioned in the ayurved. We must know basic concepts of the ayurveda. Now in globalization world this concept of pranavaha srotas must be proved on the modern basis. Sroto aium purusha Means body is made by so many srotas. But for understanding these srotas properly charak & sushrut mentioned

Special srotas, charaka has given 14 number of srotas while sushrut given 11 number of srotas.

Pranavaha srotas starts from nose and supply oxygen to haemoglobin through alveoli.

This is clear path of pranavaha srotas, but next to it gases exchange occurs with the help of blood. This blood is firstly transferred to heart by pulmonary veins and poured to left atrium. From left atrium poured to left ventricles and all over body through aorta, arterioles and capillaries.

Thus oxygen is supplied to every cell. Same time carbon dioxide is absorbed by RBC. In each 100 ml of deoxygenated blood 7% of carbon dioxide is dissolved in plasma 23% combines with hemoglobin as carbonation and 70% is converted into bicarbonate ions. This carbon dioxide along with hemoglobin travels through veins, vena cava to right atrium of the heart. Then it is poured into right ventricle. This deoxygenated blood then transferred to lungs by pulmonary arteries. Exchange of carbon dioxide and oxygen occurs in alveoli by alveolar-capillary membrane, Mainly carbon dioxide and oxygen exchange occurs in lungs and heart. Hence acharya charak as well as acharya susarut both mentioned heart as a mulsthana, and path from nose to alveoli, alveoli to left ventricle, then to all body tissue and cells, body tissue to veins and right ventricle of the heart includes in the pranavahana dhamani. This gives clear idea about pranavaha srotas.

CONCLUSION

Pranavaha srotas is impotent & main srotas of the body. It consists from nose to alveoli via external nares, nasal chambers, pharynx, trachea, bronchus & bronchioles, which carry oxygen or carbon dioxide to lungs. From lungs these gases are transported to heart by pulmonary veins.

From heart oxygen is supplied to all body cells. Then gases exchange occurs in tissue cell level. In this process heart plays very important role so heart is mentioned as mulsthana of the pranavaha srotas. The gases path and exchange occurs nose to alveoli, alveoli to heart by pulmonary veins, heart to all cells of body by arteries, all body cells to again heart with the help of veins. This total path includes in pranavahini dhamanya.

There is very less amount of gases transported through plasma hence ancient scholars not clearly mentioned regarding vahana of prana through artery and veins this includes repiration as well as pulmonary and systemic circulation hence charak might be called as mahastrotasam, thus Charak and Susharut both described nicely and clearly about pranavaha srotas.

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