

A COMPREHENSIVE STUDY OF PRANAVAHA SROTAS WITH SPECIAL REFERENCE TO MODERN SCIENCE

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ABSTRACT

The fundamental branch of medical science is *Ayurveda*. Therefore, it is important to understand the basics of *Sharir*. *Ayurveda* offers a number of *Sharir* concepts that should be interpreted in light of modern knowledge. *Srotas* is a fundamental concept and term in *Ayurveda*, yet it should be explained to students of the *Ayurveda*. The body consists an enormous quantity of *Srotas*. *Srotas* are necessary for all physiological and pathological processes to take place in the body. *Srotas* were discussed by *Acharya Charaka* from a medical perspective, and by *Charaka* from a surgical perspective.

The first and most significant *Srotas*, known as *Pranavaha Srotas*, which transports *Prana* all across the body. By examining the *Srotas Mulasthanas*, *Lakshana*, and *Vahana* as well as any relevant literature on *Pranavaha Srotas*, respiration, etc., the concept of these *Srotas* is described, and this article elaborates on how it relates to the respiratory system and internal and external respiration. Clearing up misconceptions about *Srotas* and *Pranavaha Srotas* will be beneficial to *Ayurveda* students.

Keywords: Circulation, Channels, *Hridya*, Lungs, Oxygen, *Pranavaha Srotas*, *Prana*, Respiration, *Rasavahi Dhamani*, *Srotas*.

INTRODUCTION

The ancient sciences of *Ayurveda* explain the existence of many *Srotas* that make up *Sharir*. The body has structures called *Srotas* that are crucial for the transportation of vital components. *Srotas* are the channels found in the body that transport bodily components from one location to another. *Dhamanis*, start pulsating when they get filled up with nutrient material derived from external sources, subsequently these nutrient materials are supplied to the tissues through the process transudation, and at this level, they are known as *Srotas*.¹

“IzksrkafI [kyq ifj.kkeeki|ekukuka èkkr-wukefHkokghfu HkoUR;ukFksZu”

The channels of circulation carry the *Dhatu*s (tissue elements of their constituents) undergoing transformation to their destination.²

Tissue elements are situated in different parts of the body and each of them has channels to carry their particular nourishment. So *Dhatu*s are nourished through their respective channels and one channel cannot provide nourishment to another *dhatu* as one canal cannot irrigate trees situated in different place(direction). (“International Journal of Ayurveda and Pharma Research”) These channels are a part of the continuous, unidirectional process that produces succeeding *Dhatu*s.

The body's physiological and pathological processes both involve *Srotas* in a variety of ways. Diseases arise as a result of *Srotas* stagnation. According to *Acharya Charaka* there are 13 pair of *Sthool Srotas*.³ According to *Acharya Sushruta* there are 11 pairs of *Yogvahi Srotas*.⁴ The most important of all of these *Srotas* is called *Pranavaha Srotas*. Because *Pranavaha Srotas* are a particular kind of *Srotas* that transport *Prana*, they are also known as *Pranvaha Srotas*. Every single function of the living body is carried out by vital energy, often known as vital air. The oxygen-carrying function of the cardiopulmonary system and the *Pranavaha Srotas* are similar; they are also similar from a variety of perspectives.

MATERIAL AND METHOD: -

A review of *Ayurvedic* writings served as the foundation for this article. Materials on *Agni* and other

pertinent subjects have been compiled. (“A Critical Review of AGNI and AMA An Ayurvedic Perspective”) The primary *Ayurvedic* texts used in this study were the *Charaka Samhitha*, *Sushruta Samhitha*, and extant commentaries on these works. We have also referred to the various websites and scientific journals to collect information regarding current research on the relevant topics.

LITERARY REVIEW: -

Concept of Srotas: -

Charaka has defined it as “*Sravanata Srotamsi*” means the structure through which *Sravanam* takes place. (“www.ijrap”) according to *Chakrapani*, *Sravnat* refers to the *Sravanam* of *Rasadi Poshya Dhatu*. “*Srotas*” refers to the channels or pathways in which specific tissues are created, substances are metabolised, released, or transferred materials.

Prana Life: -

The most important of all of these *Srotas* is called *Pranavaha Srotas*. Because *Pranavaha Srotas* are a particular kind of *Srotas* that transport *Prana*, *Sushrut* provides a comprehensive explanation of *Prana*. *Acharya Sushurta* say *Agni*, *Soma*, *Vayu*, *Satva*, *Rajas*, *Tamas*, *Panchendriya*, five sense organ) and *Bhutatma* (soul) – together constitute *prana* (life).⁵

Action of Vayu: -

All the life activities of the life body are performed by the normal *Vata* which is said to be the very life of living beings.⁶

Specific action and sites of Pranavayu: -

Pranavayu is responsible for these activities.

- i. *Swasa* (Respiration)
- ii. *Sthivana* (Spitting)
- iii. *Ksavathu* (Sneezing)
- iv. *Udgara* (Belching)
- v. *Ahara* (Swallowing of food etc.)

Pranavayu mainly remains in the following places in the body.

- i. Brain and head (*Murdha*)
- ii. Chest and heart (*Uras*)
- iii. Neck and trachea (*Kantha*)
- iv. Tounge (*Jihwa*)
- v. Mouth (*Mukha*)

vi. Nose (*Nasika*).⁷

Pranvaha Srotas 's Mool: -

The heart and the *Maha Srotas* (Central cavity or alimentary tract) are the sites of origin (controlling organs) of the channels carrying *Pranvayu*.⁸

Praanavaha Srotas are two their *Mool* (chief organ) are *Hridya* (heart) and *Rasavahi Dhamani* (arteries carrying *rasa dhatu*).⁹

The main functions of Respiration: -

1. Elimination of waste products and drugs such as CO₂, ammonia, etc.
2. Thermo-regulation.
3. Maintenance of all body tissues by regularising circulation.
4. Production of speech and other modifications like crying, hiccups, etc.
5. Resonance of voice.¹⁰

Causes of Pranvaha Srotas vitiation: -

The channels carrying the life breath get vitiated as the result of-

- Wasting
- Suppression of the body the body-urge
- Dehydration
- Exercise while hungry
- Starvation
- Other violations of the laws of laws of health.¹¹

Symptoms of Pranvaha Srotodushti: -

According to *Acharya Charaka*

The following characteristics symptoms.

- Respiration is too long.
- Restricted
- Agitated or becomes shallow or short or is frequently stertorous and painful.¹²

According to *Acharya Sushurta*

- When these are injured symptoms such as
- Crying with pain,
- Bending of the body,
- Delusion (Loss of consciousness),
- Giddiness and
- Tremors or death manifest.¹³

Treatment of Pranvah Srotas

Management of *Pranvah Srotas* vitiation is on the line of treatment of *Swasiki Kriya* (that indicated for disease of respiratory organs).¹⁴

Respiration and Pranavayu: -

Pranavayu is responsible for respiration. The normal air having excess quantity of oxygen is inhaled while the so called impure (having carbon dioxide in excess) is excreted. This *Pranavayu* inhaled through lungs is circulated in all the tissues of the body through the process of blood circulation. The normal *Vayu* is thought to be the most important factor for life."

The term *Praṇoparodha* is used for excessive holding of breath.' Here *Prana* indicates external air. The *Pranavayu* circulates in the whole body and maintains the body while *Apana* is known to be responsible for the excretory system and remains in the pelvic region in the body. The group activities which provide the supply of oxygen to the body tissues and excretes carbon dioxide, which is eliminated from the external and internal activities of the body can be understood as respiration.¹⁵

Swasana Kriya (Respiration): -

Respiration (*Swasana* or *Praṇana*) has been recognised as the symbol of life. The word *prana* is completed from an *a* (root verb) with *pra* affix means the efficient cause (*Nimitta Karana*) of respiration (*Praṇayatiti Praṇah*). *Acharya Sarngadhara's* description regarding respiration presents a very logical and attractive picture of this activity. *Samhita* describes that the *Pranavayu* residing in naval region touching (passing through) cardiac space outcomes through *Kantha* (trachea) for drinking (having a good contact and even assimilating it) the *Viṣṇu Padamṛta*. After drinking the *Piyasa* (nectar or taking oxygen or pure air from the atmosphere), it again enters the body with force. The *Pranavayu* provides strength to the whole of the body (*Prinayana Dehamakhilam*) and provokes the digestive fire (*Jivayana Jatharanilam*). *Vayu* in *Ayurved* has been described to have five kinds. *Pranavayu* is one of these kinds that has been recognised as respiration and symbol of life as well as the symbol of soul, or consciousness. In common and normal activities of *Vayu*, respiration is the most important action.¹⁶

Action of Pranavayu- A wider base: -

Seats of *Pranavayu* are heart, lungs and head (brain) and it moves in the organs like throat and thorax. It performs (or helps in) all the actions which are completed by these organs. It is *Pranavayu* which provides energy and strength to all these organs. The lungs and heart, through their movements (*Prasbandana*) like contraction and flexion (*Akuncana* and *Prasara*) provides circulation of oxygen (*Pranavayu*) to all the tissues in the body as a mixture with *Rasa* and *Rakta Dhatus*. *Pranavayu* also helps in swallowing the food and in this way maintains the body and life. According to *Sushruta*, *Agni* (*Pitta* digestive fire or enzyme) *soma* (*Kapha*) and *Vayu*, three mental *Doshas* viz. *Sattva*, *Rajas* and *Tamas* five sense organs and *Bhutatma* (soul), these 12 are described as *Prana*.

Hridaya and *Mahasrotas* are the sites of original controlling organs of the channels carrying *Pranavayu* (vital breath). Abnormal respiration like too long, too short, too restricted, aggravated, shallow or frequent respiration associated with sound and pain are the symptoms of the vitiations of *Pranavaha Srotas*. According to *Sushruta Pranavaha Srotas* are two in number and their sites of origin are heart and arteries or channels carrying fluids (blood or life nutrient fluid). Symptoms of the penetration of *Pranavaha Srotas* as are *Akrosana* (crying) *Vinaman* (bending downward), *Mohana* (fainting) *Bhrama* (vertigo) and *Vepana* (tremors) and *Marana* (death). Besides respiration, *Pranavayu* remaining at *Murdha* (head) and moving in the area of neck and throat controls the *Manas* (mind), sense organs, and activities like blood circulation, sneezing (*Kshavthu*), eructations (*Udgar*) etc. which are essential for life. Performing all these activities *Prana* is called life. The two lungs which are directly associated to the heart through arteries and veins can be compared with *Pranavaha Srotas* as. These *Pranavaha Srotas* as (channels carrying vital breath) get vitiated by wasting, suppression of natural urges, indiligence in dry things, performance of exercise.¹⁷

Respiration and Pranavayu: -

Pranavayu is responsible for respiration. The normal air having excess quantity of oxygen is inhaled while the so-called impure (having carbon dioxide in excess)

is excreted. This *Pranavayu* inhaled through lungs is circulated in all the tissues of the body through the process of blood circulation. The normal *Vayu* is thought to be the most important factor in life.

The term *Pranaparodha* is used for excessive holding of breath. Here *prana* indicates external air. In so many references it has been used as twins i.e., *Pranapanau*. Gangadhara has explained *Prana* as inspiration and *Apana* as expiration. The *Pranavayu* circulates in the whole body and maintains the body while *Apana* is known to be responsible for the excretory system and remains in the pelvic region in the body. The group activities which provide the supply of oxygen to the body tissues and excretes carbon dioxide, which is eliminated from the external and internal activities of the body can be understood as respiration.¹⁸

Importance of Pranavayu and Respiration: -

Pranavayu has got very important role in the maintenance of the body as of life, though *Vata Dosha* is not only respiration, but even respiration is also the most significant form of external air, which is felt by a common man and performs various activities in the life. The respiratory system eliminates carbon dioxide from the blood (and from all the tissue of the body) which is generated by cellular respiration, while it replenishes the oxygen in the body. In a healthy persons CO₂ is expelled from lungs at the same rate at which it is formed in the tissue.

Gas exchange in the body occurs by flow of gases and solution of gases through tissue. During external respiration oxygen enters and carbon dioxide leaves the blood in the lungs.¹⁹

DISCUSSION

According to *Charaka*, they are the channels that transport the changed material after digestion, all other structural components of the body are just a representative element of *Srotas Shareera*. *Charaka* believed that the human body was simply the culmination of numerous *Srotas*. *Acharaya Charaka* has attempted to provide a scientific explanation of the meaning of *Srotas* based on the aforementioned argument.

Charaka and *Sushruta* distribute their *Mulasthanas* in accordance with their role as *Bhava* storage or relay centres. The second *Mula* is regarded as the *Bhava's* conducting system.

The word "*Pranavayu*" is utilised in the *Pranavaha Srotas*. In other words, *Pranavaha Srotas* refers to the locations where *Pranavayu* resides and travels. Again, on the basis of this, the majority of *Acharyas* regard respiratory system to be comparable to *Pranavaha Srotas*. "*Pranayatana*" is a combination of the words "*Prana*" (the Hindu word for life) and "*Ayatan*" (the term for habitat). It implies that the unique environment in which life exists is regarded as *Pranayatana*. The diseases *Pranavaha Srotodusti* refers to as respiratory system diseases include *Shwasa* and *Kasa*. *Hikka* is a condition that, according to *Ayurveda*, affects the *Pranavaha Srotas* but, according to modern medicine, affects the gastrointestinal system. on the basis of this, it can be deduced that breathing must cease during an episode of *Hikka*, and *Hikka* can be a sign of advanced respiratory issues since *Hikka* is a symptom of many respiratory diseases. *Pranavayu* and *Udanvayu*, appearing as *Uchhwas* and *Nishwas* at the same time, assist in the performance of *Shwasankriya*. Complete respiration is created by the combination of the *Udangati* (expiration) and the *Prangati* (inspiration).

In the instance of *Pranavaha Srotas*, air entered by the external atmospheric and passed through the pharynx, larynx, trachea, right and left bronchi, then the bronchioles, and lastly the alveoli.

Oxygen travels along this route.

Thus, the lungs are supplied with external air oxygen. Carbon dioxide and oxygen are exchanged during gas exchange in alveoli. No ATP is used because this mechanism is entirely passive. The physical and chemical processes of gas transport between the lungs and bodily tissue. By using the diffusion method across capillary and alveolar barriers, breathing gases are exchanged.

Only 1.5% of oxygen is carried in the dissolved state in blood plasma because it is difficult for oxygen to dissolve in water. Additionally, the remaining 98.5% of oxygen is carried inside RBCs via chemical

interaction with haemoglobin. 20 ml of oxygen and 0.3 ml of dissolved oxygen are present in each 100 ml of oxygenated blood.

The *Pranavaha Srotas* begins in the nose and moves through the alveoli to oxygenate the haemoglobin.

The *Pranavaha Srotas* clearly follow this course, blood is used to exchange gases in the area nearby. Prior to being poured into the left atrium, this blood is first transported to the heart via the pulmonary veins. Aorta, arterioles, and capillaries carried blood from the left atrium to left ventricles and throughout the body.

CONCLUSION

The *Pranavaha Srotas* is essential to maintaining the body's regular functionality. It performs a variety of functions thanks to the *Prana Vayu*, a highly important substance, that passes through it. The *Rasavaha Dhamani* is engaged in the movement of *Pranavayu* throughout the body, and its *Hridaya* and *Mahasrotas* are the *Mulasthanas* of *Pranavaha Srotas* and are primarily vitiated in disorders of *Pranavaha Srotas*. It is important to study *Pranavaha Srotas* in relation to other main systems, such as the neurological system (that regulates respiration), and the cardiovascular system, rather than just in relation to the respiratory system.

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