PRANAVAYU – PHYSIOLOGICAL UNDERSTANDING: A REVIEW

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ABSTRACT

There are five types of Vata namely: Prana, Udana, Vyana, Samana and Apana. Head is principle location of Pranavayu. Other mentioned locations are neck, tongue, mouth and nose. One of the functional areas of Pranavayu is heart. Disturbance to Pranavayu functions affect entire vatadosha system. The functions of Pranavata is said to be Sthivana (spitting), Ksavathu (sneezing), Udgarra (belching), Nisvasa (Inspiration), Annapravesha (swallowing), buddhi, Hrudhaya, Indriya, chittadhruk (proper functioning of sense organs, heart, intelligence and mind). Respiratory movements of chest are one of the ways for perceiving Pranavayu. Prana, one of the five types of vata, controls the functions of vital organs like heart, brain etc. It is for this reason that Prana is considered prime amongst all the types of vata. Along with controlling the functions of the heart, it is also responsible for maintaining and sustaining the body functions. Functions of Pranavata can be related with the functions of brainstem.

Keywords: Pranavayu, Vata, Functions of Brainstem

INTRODUCTION

Dosha, dhatu, mala together forms the basis of the body. The balance of these entities represents the healthy state and im-balance will cause various diseases. In normalcy, dosha will be performing their own functions and individual dosha have their own specific site.

Vata or vayu is the most important dosha amongst the tridosha in the body. The other two doshas as well as the Dhatus and Malas are immobile having no mobility of their own. Just as the clouds are carried from one place to the other by wind all the other constituents of the body are carried from one place to other by vata.

It is for this reason that all these constituents the Dhatus, the malas as well as the two other Doshas viz. pitta and kapha are considered “Pangu”.

Though vata is a single entity in the body, based on the functions performed, it is classified in to five types i.e. Prana, Udana, Vyana, Samana and Apana as explained by Devdatta, the reversed commentator of Charaksamhita.

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**AIMS AND OBJECTIVES**

1) The main aim of this article is to understand the various functions of Pranavayu.

2) Functional understanding of the brainstem is necessary to understand physiology of Pranavayu.

**MATERIALS AND METHODS**

For this study, the basic and conceptual materials have been collected from the Ayurvedic classics i.e. Brihattrayee mainly the SusrutaSamhita, Charak Samhita and other classics with the available commentaries, as well as various reference books to be reviewed.

**DISCUSSION**

All functions considered together by all compendia can be enumerated and explained as follows.

1) *Pranavalambana* – As long as this vayu is functioning in body, it lives. This function is expressed through respiratory movements. It can therefore be derived that pranavayu keeps a living person alive.

2) *Swasanam – Nisvasa* is name given by Vagbhata to inhalation of air through nose. He states inhalation of air through nose. He states inhalation is due to pranavayu. Prasvasa is exhalation. Respiration comprises inhalation and exhalation. Sharangdhara proposes that process of respiration is due to pranavayu. Prasvasa is exhalation. Sharangdhara has described channel for prana and names it as pranavahasrotas. Commentator Chakrapani elaborated this verse. He added that existence of special channel is necessary for such important vata type as Prana. He comments that all types are circulating through all channels yet pranavayu has separate channel.

Nuclei in the pons are the pneumotaxic area and apneustic area of the respiratory center. The medullary rhythmicity area of respiratory center adjusts the basic rhythm of breathing. This function can be related with nisvasa function of pranavata. From the respiratory center the skeletal muscles of ventilation, particularly the diaphragm are alternatively activated to cause air to move in and out of lungs. Breathing occurs rhythmically. This rhythmicity is generated within respiratory centers that are located in the medulla and pons.

3) *Annapravesha* – Ingestion of food is annapravesha. Since area of functions of Pranavayu extends upwards from abdomen towards mouth, this function comes under territory of Pranavayu.

Once food is taken in mouth pranavayu directs this food to stomach. Food is one of three "Bahyaprana" namely; air, food and water. Pranavayu helps this prana to enter inside body through mouth and inside digestive organ, stomach, through esophagus.

Deglutition center of medulla promotes swallowing or deglutition of a mass of food that has moved from oral cavity of the mouth in to pharynx. This can be related with Annapravesha function of pranavata.

4) *Hrdyadharnam* – Chetana principle abides in heart. Rasa and Rakta are circulated by heart. Heart is one of ten pranayatanani. Digested food is converted in to Ahararasa. This ahar-rasa is responsible for strengthening heart. Role of Pranavayu in ingestion of food is mentioned above. Pranavayu gets involved in strengthening heart more by way of looking after Oja, which is located in heart. Since heart is
site of Prana. Pranavayu takes care of heart and takes care of Oja as well. The cardiovascular center of medulla oblongata regulates the rate and force of heartbeat and diameter of blood vessels. This function can be related with the Hrudaya related function of pranavata.

5) Control of intellectual functions of mind: Heart is site of pranavayu. Heart is a site of Jivatma. As pranavayu takes care of heart, it looks after requirement of Jivatma. Mind is an instrument for Jivatma to grasp feeling of pleasure and misery. Mind is,” indriya” and Pranavayu takes care of all indriyani of body. This is how this function is included in responsibilities of pranavayu.

Some parts of the brainstem (reticular formation of mid brain.) are the components of limbic system which is mainly involved in intelligence and other higher mental functions. This function of brain stem can be related with Buddhi related function of Pranavata.

6) Control on sensory and motor organs – By way of taking care of all indriyani, pranavaha controls and strengthens them. The anterior part of midbrain contains paired bundles of axons known as cerebral peduncles, which consist of axons of the corticospinal, corticopontine and corticobulbar tracts. It conducts nerve impulses from motor areas in the cerebral cortex to the spinal cord, pons and medulla respectively. Posterior part of midbrain called the tectum, contains four rounded elevations. The two superior colliculi, serve as reflex centers for certain visual activities (eye movements for tracking moving images and scanning stationary images. Superior colliculi are also responsible for reflexes that govern movements of the head, eyes and trunk in response to visual stimuli. The two inferior elevations, the inferior colliculi are part of auditory pathway, relaying impulses from the receptors for hearing in the inner ear to the brain. The medulla also contains nuclei that are components of sensory pathways for hearing and equilibrium (balance).This function of brainstem can be related with the Indriya related function of pranavata.

7) Sputum expulsion, sneezing and belching –
Mucous expulsion accumulated in airways of neck and thorax through oral cavity is function of pranavayu. This along with sneezing and belching is specific function of pranavayu due to its typical ‘gati’ or direction. Since functions of Pranavayu are inhalation, ingestion etc. direction of Pranavayu could be from outside of body. But direction of expectorating mucous is from inside out. Direction of belching is from inside out so is of sneezing. Whenever there is any obstruction to its direction, since pranavayu is vitally important for life, clearance of obstruction is supposed immediate. This could be the reason of allotting functions like expulsion of mucus, sneezing, belching to pranavayu.

Commentator Dalhana of Sushruta-samhita defines some of these functions as follows:
1) Spitting sputum is sthivana. i.e. to forcefully clear tracheal and pharyngeal mucous.
2) Expulsion of accumulated intense prana and udana through nose is ksavathu.
3) Expulsion of gases aborally through mouth with noise is udgar.
Nuclei in the medulla also control reflexes for vomiting, swallowing, sneezing, coughing and hiccapping.
Vomiting center of the medulla causes vomiting; the forcible expulsion of contents of upper gastrointestinal tract through the mouth. It is also responsible for spitting the food out and also responsible for belching. This function of brainstem (medulla oblongata) can be related to sthivana, udgarkarma of pranavata.

Sneezing involves spasmodic contraction of breathing muscles that forcefully expel air through the nose and mouth. This function of brainstem can be related with the ksavatu function of pranavayu.

Hiccupping is caused by spasmodic contractions of the diaphragm that ultimately result in the production of a sharp sound on inhalation.

CONCLUSION
Functions of Pranavayu are varied but come in a particular system. It is responsible for upward movement but it crosses the kantha-pradesh and reach the moordha. Its function can be co-related with the functions of brainstem.

REFERENCES

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Source of Support: Nil
Conflict of Interest: None Declared