THE PHYSIOLOGICAL STUDY OF PRANVAYU W.S.R. TO RESPIRATION

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ABSTRACT

The physiological process of respiration, which promotes gas exchange, depends on the appropriate operation and interaction of the respiratory drive, a central brain control system, sensory input systems, the lungs, and the respiratory muscles. The processes that enable gas exchange at the cellular level during respiration comprise taking in O\(_2\) and expelling CO\(_2\).\(^1\) According to Ayurveda, Prana Vayu is the foundation of human life. Because the respiration process is controlled by Prana Vayu. Pranavayu aids in creativity and evaporation. Pranavaha Srotas are the tracts (Srotas) through which Pranavayu runs.

Key Words: Pranayu, Pranvaha srotas, Physiology, rate and regulation of respiration

INTRODUCTION

Respiration is a vital sign of life. According to Ayurveda the human body is composed of doshas, Dhatus and Mala.\(^2\) Out of Tridosha, Vata is a Pradhan Dosha which is said to be Parana. In Ayurveda Pranavaha Srotas has been described by Charka and Shushruta. Pranavaha Srotas are the tracts (Srotas) through which Pranavayu runs. Prana Vayu is compared to atmospheric oxygen, which is essential for carrying out life's essential processes. The features highlighted in the process of respiration in contemporary medical studies are clearly similar to the facts as described by Ayurveda experts far earlier.
Prana, Apan, Udan, Saman, and Vyan are the five different forms of Vayu that Acharya Charak has identified. It allows the body to move freely in various locations while maintaining good coordination. Vayu is life, power, and the source of all life. Vayu is everything; it is the supreme being.³

According to Acharya Sushruta, Prana Vayu is Vaktra Sanchari (circulate in oral cavity). Hiccup and Swasa rog are brought on by its vitiation. According to Acharya Dalhan's commentary, the heart, throat, head, and nose are all affected by the field and action of Prana Vayu.⁴

In Astanga Hridaya, Acharya Vagbhat has described that main place of Prana is Murdha and it travels in Uras, Kantha, Hridaya and it governs memory, heart, senses and mind.⁵ Acharya Sharangdhar provides a very excellent description of the physiology of respiration in Ayurveda in the Sharangdhar Samhita. According to him, Prana Vayu originates close to Nabhi, travels to Hridaya, and then emerges at the throat to take in Vishnupadamrtam. After consumption, the same quickly returns to nourish the entire body and to activate the Jatharagni.⁶ Ayu is the result of the combination of Sharir and Prana. Pancatva is the term for the separation of these combinations.

Aims And Objective
1) Physiology of respiration according to Ayurveda.
2) Possible correlation of process of respiration with Pranayu as per Ayurvedic and modern science.

Subtle Prana
Along with prana Vayu (a kind of Vayu), term Prana is also referred as a subtle vitality element too. This subtle Prana is said to be located at Pranayatana (10 special sites of Prana). It is also reside at Marmas (vital points), along with Rakta, particularly in tri Marma (three vital organs) and at Nabhi. There is also a unique conceptualization of the twelve Prana in Sushruta Samhita.

Sthan and Karma of Pranayu
According to the classical text, Prana Vayu is said to be placed at the Murdha (head), Urah (chest), Kantha (throat), Aasya (mouth), and Nasika (nose).⁷ According to Ravi Dutt Tripathi (2009), it is the cause of Stheevana (spitting), Kshavathu (sneezing), Udgar (belching), Shwasa (respiratory phenomena), and Aahar karma (deglutition of food). Similar ideas have been explained by Vagbhata. He asserts that Prana Vayu travels via the chest and neck and resides at Murdha. It is in charge of the honourable Dharana of Buddhhi, Hridaya, Chitta, and Indriya.
Pranavaha Srotas

Srotas are the structure or channel through which Sravanam Karma, or the flowing, moving, oozing, and penetration of various body components and nutrients, takes place. The Pranavaha Srotas is undoubtedly the system for transporting Prana, which has been described as the vital air (vital breath) that is inhaled as well as the vital energy that powers each and every activity of a living being. As a result, in the context of these facts, the idea of Pranavaha Srotas is also comprehended. One of the five forms of Vayu has the term "Prana," which is frequently employed and seems fitting. This Prana Vayu denotes atmospheric air, which is necessary for breathing and maintaining life's vitality.

Functions of Pranavaha Srotas

Prana is most importance in our body. Prana performs bodily movements, the contraction and relaxation of the Dhatus, and heartbeat, and Pranavaha Srotas holds the power of Prana. The proper operation of the Pranavaha Srotas is necessary for the body's activities. Panchabhautik Ahara and Ambarpiyusha are used to make up for the losses experienced throughout various forms of Sharira Kriya, and Pranavaha Srotas also accept the Ambarpiyusha. Phupphusa and other related muscles are crucial for the acceptance of Ambarpiyusha as well as for the contraction and relaxation of the Mahapracirha Peshi. The source of this stimulation is Abhyantara Prana.

If there is contamination in the nutritive Vayu or less in amount or disturbance in its passage, Prana Vayu provides the sustenance for the remaining Vayus. Then, other Vayu's functions are also affected. As a result, ailments in the body are caused by disturbed Dhatu and mala functioning. When food is digested, Vayu yields mala Vayu, which is Niyanta, a praneta of sharir and mana.

Physiology Of Respiration

The two primary sites of pran vayu are the head and chest. Sites of pranvayu also include the head, neck, mouth, tongue, nose, heart, mind, and intelligence. Living things' pranas remain in the umbilicus, and the umbilicus depends on pranas. Similar to how the wheel's nave is encircled by spokes, the umbilicus is surrounded by siras.

The physiological process of normal breathing has been characterised by Acharya Sharangdhar in Purvakhanda as the entire process of normal breathing to distant transportation of organ to the tissue and the cells. He stands with the belief that the prana Vayu, which is located in the Nabhi Pradesha (centre of the body), emerges through the neck, touches the lotus-like heart, and then reenters forcefully after becoming soaked with Vishnu Padamrata (O2) from atmospheric air. According to this, breathing begins at the Nabhi, which might be regarded as the umbilical region and is supported by the abdominal muscles. The diaphragm plays a significant part in the breathing process. Where the diaphragm touches Hrut Kamalantram, it causes the expiratory and inspiratory processes of respiration to occur. The lungs are where gaseous exchange occurs after the inhaled air has passed through the trachea. The heart (Hrdaya) and phapphus are constantly pumping out a particular amount of blood (lungs). This blood removes its waste CO2 through exhalation while absorbing Ambarpiyush (O2) from the air that is present inside.
Rate of Respiration

‘Swasanamana’ refers to a number of respirations per day. Yoga Chudamani counts twenty one thousand six hundred respirations (21600) per day. Converting this to hours & minutes, it becomes fifteen respirations per minute (15/ min).

Regulation of Respiration

The neurological system's control of ventilation is referred to as the activities of Prana and Udanavata. Udana Vata controls the activity of exhalation, and Prana Vata controls the activity of inspiration. Neurons in the medulla and pons control the fundamental aspects of breathing. Both excitatory and inhibitory inputs can cause the respiratory centres in the medulla and pons to respond. the centre for pneumotaxic inspiration. The Pranavayu, which is seated at the head or brain, regulates Swasa, or perspiration, as well as its various modifications, such as sneezing, etc. The interior covering (Avarana) of Vayu dosa is where the quantity of Swasanas (respiration) increases and decreases, according to Charka Samhita. As a result, the Pranavayu, which is seated at the Murdha (brain), governs Swasana karma in life.

CONCLUSION

Murdha is the primary location of Prana Vayu (head). Head in this sense refers to the brain and brainstem, and according to all Acharyas, Prana Vayu is responsible for performing Swasa Karma, which is quite similar to the respiratory centre in the medulla and pons of the brain stem, which performs respiration. A human person may exist without their eyes, hearing, legs, etc., but not without breathing and eating, according to Chandogyopanishad, one of the oldest Upanishads. Life stems from these two elements and is entirely dependent on them. This is the life force (Prana) or vital energy that resides within them. The organs that aid in this exchange of gases are the lungs. The vital life force, known as Prana, and the gases are transported through the respiratory system. Therefore, maintaining the respiratory system is crucial. Poor food, seasonal fluctuations, dirty air, and a lack of exercise can all contribute to respiratory tract issues. Controlled diets can enhance respiratory health. The best course of action is to stay away from fried foods and eat light for breakfast and dinner. Having a glass of warm water might relieve chest congestion. complete body warming Another method for maintaining respiratory health is through yoga, meditation, and Pranayama.
REFERENCES


