

Shavasa-Prashwasa Prakriya (Respiration) and its Assessment in Contemporary science (w.s.r to Spirometry)

Author: Mahereen Fatema Kazi¹

¹Dr. Rajendra Gode Ayurved College and Hospital, Amravati, Maharashtra, India

ABSTRACT

Tridosha Sidhanta is one among the Basic Principle of *Ayurveda*. *Samdosha* (Homeostasis of *Tridoshas*) the human body is indicator of good health. Of these three *Doshas*, *Vata Dosha* governs all bodily movements. Notably, the respiration process primarily involves *Prana Vata* and *Udana Vata*, whose functions and locations are detailed in *Ayurveda*. *Ayurvedic* texts discuss their importance in respiration. This paper aims to clarify why assessing *Prana* and *Udana Vayu* is essential for evaluating an individual's health. It further discusses how such *Ayurvedic* assessments can complement Spirometry tests, which measure the volume of air inhaled and exhaled, thus bridging traditional and modern approaches to understanding respiration.

Key Words *Shavasan Prakriya* (respiration), *Prana Vayu* and *Udan Vayu*, Spirometry

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INTRODUCTION

Ayurveda, being a comprehensive healthcare system, provides benefits for the common people. *Ayurveda* principles play a very crucial role in day-to-day life. By applying these principles, one can lead a good and healthy life. *Tridosha Sidhant* is one among basic principle of *Ayurveda*. *Vata Dosha* in human body is responsible for many activities in the body. *Shawasan* (respiration) is one among them. Basically, *Prana Vayu* and *Udan Vayu* take the primary role in the process of respiration. The process of inhalation is guided by *Pran Vayu*, and exhalation is guided by *Udana Vayu*. *Acharyas* denoted that *Pranavlamban* is the function of *Prana Vayu*.

By *Dalhana Teeka* and by *Aadhmall* in *Sharangadhar Samhita* if respiration remains normal, life is maintained.

In modern physiology the mechanism of respiration come under respiratory system. Spirometry is a method for objectively assessing the lungs capacity. English surgeon John Hutchinson was the inventor of the spirometer. FVC was defined 150 years ago by him. Hutchinson found that when Forced vital capacity (FVC) was large, a patient lived longer as compared to small Forced vital capacity (FVC) value.

According to a study of European Journal of Internal Medicine it was reviewed and discussed available evidence supporting that spirometry is

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an overlooked global health marker, that could be used regularly through the lifespan to monitor human health and predict risk of chronic respiratory and other chronic non-communicable diseases (NCDs)¹. Assessment of functions of *Pran Vayu* and *Udan Vayu* will be the helping tool in the in the assessment of a person health status and by monitoring lungs parameters by Spirometer we will help to improve lungs function by *Ayurvedic* modalities.

AIM

To study *Shavasa-Prashwasa Prakriya* (Respiration) and its Assessment in *Ayurveda* and Contemporary science (w.s.r to Spirometry).

OBJECTIVES

1. To study the *Shavasa-Prashwasa Prakriya* (Respiration) in *Ayurveda* text
2. To study the assessment respiration in *Ayurveda* and Contemporary science (w.s.r to Spirometry).

MATERIALS AND METHODS

1. Classical Books of *Ayurveda*,
2. Modern Literature
3. Research related to this study

REVIEW OF LITERATURE

The word *Shavasa* is firstly introduced in *Upanishada*. In *Amanaskopnishada* the word *Shavasa* is mentioned for respiration. Dictionary meaning of *Shavasa* is breathing and the word

Shavasa-Prashwasa Prakriya denote the process of breathing. *Acharya Sharangadhar* has described *Shavasan Prakriya* in a detail which is similar to the process of Respiration.

The process of respiration is mainly under control of *Prana Vayu* according to *Ayurveda*. *Acharya Charak* has described channel for *Prana* & named it as *Pranavaha Strotas*. The *Mula* of *Pranavaha Strotas* according to *Acharya Charak* are *Hridya* and *mahastrota*².

In *Pranavayu strotas*, external *Prana Dravya* is converted into absorbable form & then it is transported with *Rakta* throughout the body³.

Functions of *Prana Vayu*:

Its functions are *Stivan* (Expectoration), *Shvathu* (Sneezing), *Udhgar* (Belching), *Shvasa* (Respiration) & *Aahar adi*. (Ingestion of food) etc⁴.

According to *Dalhana*, the functional sites of *Pranavayu* includes all sites mentioned by *Acharya Charak* and that *Pranavayu* looks after cardiac affairs⁵.

Udana word originates from *Udh Dhatu* with *Aan* suffix, which simply means breathing upward. Or which goes upward⁶. As during the process of Respiration, the process of exhalation can be understood as the function of *Udan Vayu*.

Location of *Prana Vayu*:

Acharya Charak has denoted the location of *Prana Vayu* as *Murdha* (Head), *Uru* (Chest), *Kantha*(Neck), *Jivha* (tongue), *Aashya* (mouth) and *Nashika* (Nose)⁷.

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According to *Asthang Hridaya* commentator *Arundatta, Murdha* (Head) is principle location of *Pranavayu*⁸.

According to *Acharya Sharangdhara*, *Prana Vayu* resides in Heart⁹.

Extended areas of function of Prana Vayu:

According to *Asthang Hridaya* commentator *Arundatta, Uru* (Chest), *Kantha* (neck) are main extended areas of function of *Pranavayu*⁸.

According to *Acharya Sharangdhara, Nabhi* (Umblicus) is the extended area of function.

In *Dalhan Tika*, *Kantha* and *Nashika* were mentioned as extended area of *Prana vayu*¹⁰.

Location of Udan Vayu:

Acharya Charak has mentioned the location of *Udan Vayu* as *Nabhi* (Umblicus), *Uru* (Chest), *Gala* (Neck) etc¹¹.

According to *Asthang Hridaya* commentator *Arundatta, Uru* (Chest) is principle location of *Udanavayu*¹².

According to *Acharya Sharnagdhara, Phupphas* are the primary location of *Udan vayu*¹³.

Extended areas of function of Udan Vayu:

According to *Asthang Hridaya* commentator *Arundatta, Nasa* (Nose), *Nabhi* (Umblicus) and *Gala* (neck) are main extended areas of function of *Udan Vayu*.

Functions of Udan Vayu:

According to *Acharya Charak*, functions of *Udan Vayu* are *Vak-pravriti, Praytana, Urja, Bala, Varna* etc¹⁴.

According to *Acharya Vaghbhatta*, along with above functions, *Srotopreenan, Dhyee, Dhriti,*

Smriti and *Manovibodhana* are also the function of *Udan Vayu*.

According to *Dalhan, Uchchhvasa* is the function of *Udan vayu*¹⁵.

All the above references indicate the important role of *Prana Vayu* and *Udana Vayu* during the process of respiration.

Shvasan Prakriya:

In *Brihat-trayi*, the respiration problems are described under *Prannavaha Strotas* but the *Shvasan Prakriya* is not directly mentioned.

Pathological features are presented. It is required to assume that respiration, which is devoid of these symptoms, is Physiological.

Physiological features of Respiration:

According to *Yoga Chudamani Upnishada* the number of *Shavasanam* has been counted as twenty-one thousand and six hundred in twenty-four hours. One *Shawasan* will take 4 seconds approximately. The depth of respiration assessed clinically whether expiration gets increased or inspiration gets obstructed in both these conditions; the depth of respiration gets altered. It should be concluded that physiological measures are indicated in respiration being normal. No particular range of volume is provided. In Yoga science, the complete *Pranayama* has mentioned the measurement as twelve *Anguli*.

Umberpiusha is competent to sustain a person. Nectar coming from the sky is the virtual meaning of *Ambarpiusha*. Hence, *Ambarpiusha* can logically be interpreted as oxygen from the environment.

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Nabhi is umbilicus. The foetus receives food as well as oxygen supply through maternal blood. The other reason behind mentioning the *Nabhi* in the respiratory process is that the respiratory movements include thoracic as well as abdominal movements. Abdominal movements are noticed through moving umbilicus. The phenomenon of breathing has been described by *Acharya Sharangdhara*. According to *Acharya Sharangdhara*, *Prana Vayu* located in *Nabhi Pradesh*, from *Nabhi* it came out from throat by touching the lotus like structure *Hridaya* (Heart) and after saturating with *Amber Piyush* it gets forcefully back into the body and nourishes the whole body tissue and *Agni* also. This highlights how Ayurveda extensively discusses the process of respiration.

Spirometry: Spirometry test is used to assess the lungs capacity. It measures the amount of air an individual can blow out. The amount of air that a person can be expired after deep possible inspiration is termed as Forced vital capacity (FVC). Generally, the lungs function is at its peak at the age of 20-30 years. Lungs age may be slowed by smoking, repeated pulmonary infection, occupational exposure, or malnutrition. Regular aerobic exercise in growth year may increase lungs volume; therefore, in young athletes they may have obtained an FVC that is higher than non-athletic.

After the age of 30, FVC do not increase with exercise, but the improvement in cardiovascular fitness and endurance can be achieved. After 30 years of age, lungs tissue begins to lose its

elasticity gradually, and the airways begin to close prematurely as a result the Forced vital capacity (FVC) decreases by 0.2L per decade.

Lungs are the vital organs related with the function of respiration. In healthy person, the lungs functions are also studied. Lungs function is different in different individuals according to age, sex, height, weight and physical working capacity.

Further, spirometry not only has prognostic value by itself, but it also adds prognostic value to other health markers frequently used in practice, such as arterial blood pressure, body mass index and/or glucose or lipid blood levels¹⁶.

Indeed, Spiro-metrically determined lower than normal lung function trajectories are associated with significant cardiovascular and metabolic health consequences, as well as with premature death¹⁷. By contrast, supranormal trajectories are associated with healthier ageing¹⁸.

Recent research has also shown that young adults with impaired lung function associate a higher prevalence, and about a decade earlier incidence, of cardiovascular and endocrine (diabetes) abnormalities, as well as premature death, suggesting that poor lung development may be a marker of poor development of other organ systems¹⁷.

DISCUSSION

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1. Measuring Lungs function in an individual will give a clue of health status of an individual.

2. As mentioned in research, lower than normal lungs functions having significant association with cardiovascular and other metabolic disorders, by improving lungs functions with the help of herbs mentioned in Ayurvedic text one will be able to improve health status.

3. *Acharya Charaka* has mentioned that *Hridaya* and *Mahaastrota* are the location of *Prana Vayu* therefore *Prana Vayu* looks after Cardiac affairs and also on digestion.

4. According to the Ayurvedic context, *Udana Vayu* is responsible for *Ucchawasan*(expiration), when the *Udana Vayu* is in good state it will perform its other function properly. *Bala* is the another function of *Udana Vayu*. In a study it is also suggested that poor lungs development may be a marker of poor development of other systems. Therefore, *Prana Vayu*, *Udana Vayu* and lungs function all these factors are interlinked.

5. Regular Yogic practices during young age may improve lungs function and strengthen the function of other systems also.

Performing spirometry will definitely help in assessment of *Prana Vayu* and *Udana Vayu* in a person.

CONCLUSION

After reviewing the Ayurvedic context and modern literature it has been concluded that *Prana Vayu* and *Udana Vayu* are two basic types of *Vata Dosha* involved in the process of respiration. Spirometry is the basic lungs function test which reflects the health status of lungs.

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