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EFFECT OF *NADISHUDDHI PRANAYAMA* ON *PRANAVAHA SROTAS DUSHTI LAKSHANA* IN POST-COVID 19 PERSON.

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Abstract

The novel corona virus-2019 (COVID-19) pandemic began in December 2019 in Wuhan, China, and quickly spread to over 200 nations around the world. COVID-19 symptoms include sore throat, dry cough, nasal congestion, arthralgia, sneezing, myalgia and runny nose, which are all typical in influenza. The involvement of the lungs and respiratory system in COVID is of primary concern since it can cause low blood oxygen saturation, dyspnoea, and respiratory failure, necessitating mechanical ventilation. Obesity, Diabetes mellitus, Cancer, Ischemic heart disease, post-surgery, and chronic obstructive pulmonary disease (COPD) are the most common comorbid conditions.

Due to regular practice of this *Pranayama* purification of all channels of body occurs. Since immunity plays an important role in COVID-19 infection, Non-Pharmacological Interventions which have an immune-modulatory effect, could serve as a preventive as well as a therapeutic measure for persons with COVID-19 infection. During this outbreak, numerous herbal products have also been explored as alternative therapies. *Yoga* has been practiced since times immemorial for the prevention of disease and promotion of health. Substantial research has already been done on the effectiveness of *Yoga* in the management of lifestyle disorders, preventing infection and accelerating healing and recovery. Regular practice of *Nadishuddhi Pranayama* is much useful for maintaining good respiratory health and to clear lung compliances. People should get more aware of Pranayama for healthy lifestyle.

KEYWORDS: *Ayurveda*, Corona, *Nadishuddhi*, Yoga

INTRODUCTION:

Prana Vayu, in conjunction with Udana Vayu, plays a crucial role in regulating respiration, which is a vital process for the human body. The life span of an individual is intricately linked to their respiratory rate. A steady deep respiration is associated with a longer life span, while shallow and fluctuating respiration may associate with a shorter life expectancy. In modern times, the prevalence of lifestyle-related disorders is rapidly increasing due to faulty lifestyle choices. Many of

these disorders cannot be fully controlled by medication alone, emphasizing the need for holistic approaches like Nadishuddhi Pranayama. Need of this topic aimed at enhancing the strength and functionality of the lungs, is particularly relevant in the current scenario dominated by the COVID-19 pandemic. As this virus primarily invade respiratory system, individuals affected by COVID-19 often experience symptoms such as breathlessness, dyspnoea on exertion, throat congestion and discomfort, cough, etc.

These symptoms contribute to a decrease in lung capacities, a reduction in breath-holding time, and a decline in peripheral oxygen saturation. The study on the effectiveness of Nadishuddhi Pranayama in this context holds potential significance in exploring holistic approaches to mitigate the respiratory impact of the ongoing pandemic. Sometimes late complication also seems like multi-organ failure, Myocardial Infarction, Pulmonary complications, fungal infection like Mucormycosis, Post viral arthritis, generalised weakness, exertional Breathlessness, etc

Acharya Vagbhat cited that Non-vitiated Vata brings enthusiasm in work, produces bodily processes like smooth respiration, develops all body structures or organs to their full growth and body tasks are observed to go easily.[1] All kinds of movements are due to Vata Dosha. This is the reason behind calling this Dosha as life of any living being. All the diseases are due to vitiation of this Dosha to an extent where a person may face death.[2] Vata Dosha is responsible for maintaining all mechanical moves of body Including reflex actions, moves based on electrical signals like Cardiac cycle, moves based on pressure gradient like diffusion and exchange of gases, moves based on filtration like urine formation also moves based on excretion of excreta outside body, etc. It induces imperative and unimportant, all kinds of movements. Willing or unwilling attention is duty of Vata Dosha, Vata induces all sense and reciprocation organ, it perceives sensory signals which is conveyed through all sense organs, Vata prepare architecture of body systems, it is responsible for synthesis of body entities.[3]

Among the 5 subtypes of Vayu, Prana Vayu is the most important one, Chief site of Prana Vata is head. It circulates through the throat, mouth, sense organs and chest, encompassing the vital organs and structures located in these areas. Vagbhata in Ashtanga Hridaya also tells that Prana Vayu commands Buddhi (intellect), Hridaya (mind, in this context), Indriya (sense organs and their functions) and Chitta (brain). This shows that the higher functions including perception of sense objects, the motor signals in response to the sensory signals, the thought processes, the intelligence and application of intelligence so as to lead the day-to-day activities.

Prana Vayu carries smooth breathing functions and movements. Prana Vayu on circulating in the chest makes breathing process easy by creating space for inspiration and expiration by creating movement of organs of breathing (lungs and heart) and movements of main and accessory muscles of respiration. Prana Vayu thus creates expansion and contraction of chest cavity so as to enable free breathing and good aeration in the body. Mainly it helps in breathing in (inspiration) of air or oxygen.When the Prana Vayu gets vitiated it causes diseases like Hikka(hiccough), Shwasa (dyspnoea, breathlessness, asthma, and bronchitis), Pratishyaya (cold, congestion), Swarabheda (hoarseness of voice), and Kasa (cough)[4] etc. By this it clearly looks like the pathological manifestations and the territory afflicted by the vitiated Prana Vayu is predominantly the respiratory system.

If one considers the sequence of Strotas a according to their importance then all the Acharyas agree that Praanvaha Strotas is first, as it is very important to keep the life going on. Prana Vayu means Oxygen, Wherever the Praan Vayu carries out its functions these parts and areas of the body and in the body should be considered as Praan Vaha Strotas. It is extensive and it is spread all over the body with more predominance in the head regions and the places where Praan Vayu stays predominantly are Mukha, Gala, Hrudaya, Chest, Kantha, Head (Mastishka). The symptoms

explained by Acharya Charka for Pranavaha strotas when it gets deranged, appear to be same as that of many symptoms that arise due to the disorders of the Respiratory system. Hence it would be appropriable to correlate Pranavaha strotas as a channel conveying Pranavayu within the body i.e., the respiratory system with both of its conducting and respiratory passage When it comes to the pathological aspect, the symptoms of Shwasaroga seem to be same as those arose due to the vitiation of Pranavaha srotas. Hence it is explained as Pranavaha srotas vitiation should be managed with same line of treatment of Shwasa Roga. In this context, Shwasa is one of the symptoms of respiratory system disorders. Again, this proves the close relation between Pranavaha srotas and respiratory system. All the above factors definitely indicate the Pranavaha srotas stands for nothing but the same Respiratory system.

Pranavaha srotas Dushti Lakshana:[6]

AtiSrushtam/ Deergham [Prolonged respiration], AtiBaddha Shwasan [Obstructed breathing], Kupitam [Abnormal respiration], Alpalpam [Shallow respiration], Abhikshanam [Frequent respiration], Sashabdam Shwasan [Noisy breathing], Sashula Shwasan [Breathing with pain]

Yoga is one of the oldest sciences of the world originated from India, which is very useful for both getting and maintaining the physical, mental and moral health. This Yoga was started with the development of civilization. Pranayama is described In Hatha Yoga Pradipika and Patanjali Yoga Darshana. In Hatha-Yoga Pradipika, it is mentioned that 1. When Vata in the body is moving very fast, mind will be very unstable. So, it is very necessary to acquire command over Vata. 2. Life is present in the body, whenever there is existence of Vata in the body. When there is permanent departure of Vata from the body, the death occurs. So, it is necessary to control the Vata in the body.
3. The Nadis or channels in the body are obstructed, Vata cannot flow through them fluently. So, one must clean all the channels for free flowing of Vata. 4. To do the purification of the channels in the body, daily exercise of Pranayama is necessary. 6. Practising the Pranayama daily, all the impurities or Malas get dried. So do the Pranayama regularly. 7. If Pranayama is done properly, then all the diseases get cured, but if done improperly, then all the diseases occur in the body.

Method of Nadishodhana Pranayama

If you are going to start Yoga abhyasa by proper sharir shuddhi then you hould begin it from Vasant (spring season) and Sharad (autumnseason).[7]

One has to sit in suitable meditative Asana mostly Padmasana or Sukhasana posture is easy for carrying this Pranayama. Follow the command of guru and perform Pranayama. [8]

1. Nadishodhana Pranayama should be practiced in the sitting position preferably in the position of Padmasana.

2. Now one should concentrate on breathing movements.

3. After this, one forms a special Mudra of the right palm by folding and supporting the index and middle finger together at the bottom of the thumb.

4. Keep the right thumb and middle and ring fingers gently over the right and left nostrils, respectively.

5. Press and close the left nostril gently with the middle and ring fingers and breathe in slowly through the right nostril this is Puraka Phase.

6. At the end of Puraka phase one should immediately close right nostril, as left nostril already closed before Puraka now both nostrils are closed. Breath is retained according to once capacity. This is a Kumbhaka phase.

7. Press and close the right nostril gently with the right thumb, release the left nostril and breathe out through the left nostril this is Rechakaphase.

8. Now breathe in through the left nostril in the same manner.

9. Press and close the left nostril gently and breathe out through right nostril. In this manner one round of Nadishodhana Pranayama is completed.

10. In next rotation Puraka is done by left nostril and repeat the same procedure as mentioned above.

VIRAL TRANSMISSION AND CLINICAL FEATURES

COVID-19 virus is mainly spread from person to person via respiratory droplet transmission, which occurs when a person is in close contact with someone who is actively coughing or sneezing. This occurs through exposure of the mucosal surfaces of the host, that is, eyes, nose and mouth, to the incoming infective respiratory droplets. Transmission of the virus may also occur through fomites used by or used on the infected individual such as bedsheets, blankets, kitchen utensils, thermometers and stethoscopes. Airborne transmission has not been reported for COVID-19, except in specific circumstances in which procedures that generate aerosols are performed, that is, endotracheal intubation, bronchoscopy, open suctioning, nebulisation with oxygen, bronchodilators or steroids, bag and mask ventilation before intubation, tracheostomy and cardiopulmonary resuscitation.

The incubation period of COVID-19, which is the time period from exposure to the virus to symptom onset, is 5–6 days, but can be up to 14 days. During this period, also known as the 'pre-symptomatic' period, the infected individuals can be contagious and transmit the virus to healthy individuals in the population. The patients of COVID-19 belong mostly to the 40–70 years age group, and most commonly present with fever, body aches, breathlessness, malaise and dry cough, although patients may present with asymptomatic, mild, moderate or severe disease. Some patients may also present with gastrointestinal symptoms such as abdominal pain, vomiting and loose stools.

According to WHO Covid-19 guidelines stated in 2019 COVID positive patients classified as follows[9]

MILD CASES

i. Symptomatic persons (i.e. having one of the following symptoms Fever, cough, fatigue, anorexia, loss of smell, loss of taste, nausea, vomiting, diarrhea).

ii. But having no DYSPNOEA.

iii. SPO2 saturation more than 95% on room air.

iv. Respiratory rate between 14-20 breaths/min.

MODERATE CASES

i. Adult with clinical signs of pneumonia (fever, cough, dyspnea, fast breathing).

ii. SPO2 – between 90%-95% on room air.

iii. Respiratory rate more or equal to 24 breaths/min.

iv. DYSPNOEA of Grade 2 and 3.

SEVERECASES

i. Adult with clinical signs of pneumonia (fever, cough, dyspnea, fast breathing)

ii. SPO2 – less than 90% on room air

iii. Respiratory rate – more than 30 breaths/min

iv. DYSPNOEA of Grade 4

CRITICAL CASES

Acute respiratory distress syndrome, along with shock, coagulation defects, encephalopathy, heart failure and acute kidney injury.

Pranayama Protocol for Post COVID- 19 care by AYUSH [10]

1.Nadishuddhi Pranayama =10 Rounds for 10 Mins in Morning.

METHODOLOGY:

SELECTION OF VOLUNTEERS

The volunteers were selected according to following criteria.

a) Inclusive criteria

1. Post covid-19 person between age group 18 years to 60 years.
2. Post covid-19 person having Pranavaha Strotas Dushti Lakshana.
3. Person with Post COVID period ranging between 3 to 9 months.
4. Person irrespective of gender, Socio-economic status & occupation.

b) Exclusive criteria

1. Age less than 18 years and more than 60 years.
2. Post covid-19 persons who does not having any Pranavaha Strotas Dusti Lakshana.
3. Person with post COVID period less than 3 months and more than 9 months.
4. Post Covid-19 Persons having comorbidities (like COPD, Hypertension, Diabetes Mellitus and any Other Systemic Disorder).
5. Under psychiatric treatment or having any type of drug abuse.

STUDY INSTRUMENTS:

1. Vital Capacity: Digital Spirometer

2. Breath Holding Time: Stopwatch

3. Peripheral Oxygen Saturation: Oximeter

4. Breathing/Respiratory Rate: Stopwatch

CRITERIA FOR ASSESSMENT:

1. Pulse - Radial pulse of volunteer was examined.
2. Breath Holding Time - Breath Holding Time of volunteers were measured with the help of stopwatch.
3. Respiratory Rate- Respiratory Rate of volunteers were measured with the help of stopwatch.
4. Peripheral 0_2 Saturation - Peripheral 02 Saturation of volunteers were measured with the help of Oximeter.

The selected volunteers gone through following procedure

1) Each and every volunteer was examined through Criteria for assessment.

2) Before starting of Nadishuddhi Pranayama, Vital Capacity, Breath Holding Time, Respiratory rate and Peripheral O2 Saturation were examined.

3) Then volunteers were advised to practice, Nadishuddhi Pranayama regularly in morning, 10 minutes daily for 15 days.

4) After practicing Nadishuddhi Pranayama for 15 days, again Vital Capacity, Breath Holding Time, Respiratory rate and Peripheral O2 Saturation were examined.

5) Volunteers who completed 15 days regimen successfully, again advised to do Nadishuddhi Pranayama practice regularly in morning, 10 minutes daily for next 30 days.

6) After practicing Nadishuddhi Pranayama for 30 days again Vital Capacity, Breath Holding Time, Respiratory rate and Peripheral O2 Saturation were examined.

Objective Parameters for Assessment of Pranavaha Strotas Dusthi

A. Test for Pulmonary Efficiency:

Vital Capacity by Spirometry which includes

1. FVC

2. FEV1

3. FEV1 / FVC

B. Test for Cardio-Pulmonary Efficiency:

1. Breath Holding Time.

2. Peripheral Oxygen Saturation.

3. Breathing/Respiratory Rate.

OBSERVATIONS AND RESULTS:

*1) Prana*vaha *Strotas Dushti Lakshana* Observed in Post COVID-19 Person.

*Prana*vaha *Strotas* Dushti *Lakshana*	Number of Persons	Percentage (%)
ATISRUSHTA	39	43
ATIBADDHA	23	26
KUPITA	0	0
ALPA-ALPA	14	16
SASHABDA SHWASANA	11	12
SASHULA SHWASANA	03	3

2) Severity of Disease:

Severity of Disease	Number of Persons	Percentage (%)
Mild Cases	50	56
Moderate Cases	40	44

3) Effect of Therapies on the Parameters:

Criteria	% Improvement
FVC	4.07
FEV1	11.44
FEV1/FVC%	6.94
Peripheral Oxygen Saturation	1.47
Respiratory Rate	13.40
Breath Holding Timing	24.71

DISSCUSION:

Pranayama emerges as highly beneficial for modern living, particularly for individuals grappling with cardiorespiratory conditions such as COVID-19 and COPD. Its positive effects are attributed to the activation of stretch receptors, release of

excessive tension, and strengthening of respiratory muscles. Through the expansion of lung sizes and capacities, Pranayama offers advantages to both individuals with sound respiratory health and those recovering from injuries. The biological processes underlying the protective effects of Pranayama remain to be fully investigated. Each component of the Pranayama module would have played a role in preventing COVID-19 infection. Vata-neti helps to clean the nasal passages and maintain the sinuses and helps to get rid of pathogens. forceful exhalation and normal inhalation which help to improve pulmonary function and clean the frontal sinuses, removing congestion in nasal and respiratory tract and easing movement of the diaphragm. It's very useful preparatory practices for Pranayama.

Deep breathing helps to improve lung's vital capacity. Nadi-shuddhi Pranayama helps to reduce sympathetic activity and stimulate the vagus (para sympathetic activity). It helps to reduce stress and anxiety, thus balancing autonomic function. A multi-centric study with a larger sample and longer duration/period is recommended for further testing of our Pranayama Protocol. The Pranayama protocol can also be compared to and supplemented with other Yoga /Pranayama programs. Considering the implications of the study for Health care professionals and the general public living in fear of COVID-19. Larger studies across different geographical, ethnic and cultural backgrounds are needed to verify its generalizability. The study enlightened the importance of Pranayama in day-to-day life to keep ourselves healthy. Regular practice of it has beneficial effects on various body systems. In current scenario of COVID-19 it has too much importance. So, everyone must include Pranayama in their daily schedule to keep physically and mentally fit.

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