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Design and Implementation of Selected Shatkriyas and Bhastrika Pranayama Protocol for Asthma: A Pre-Post Study

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ABSTRACT:

BACKGROUND: Pranayama and Shatkriya have been practiced for thousands of years as part of Hatha Yoga. Along with reaching the higher state of meditation, Yoga practitioners and health seekers use VIV, nasal cleansing techniques, and other methods to clean other parts of the body and attain bodily health. These practices stimulate the body by eliminating mucus out of the Naadis or energy channels i.e. kunjla kriya removes accumulated mucus from the respiratory tract and associated passages as it is adjacent to the esophagus and results in a smooth flow of air without obstruction.

METHODS: 32 participants of the age group between 18-50 years participated in the randomized control trial after applying the inclusion and exclusion criteria and who signed the informed consent. The help of ACQ to measure asthma symptoms control and DASS-21 (Depression, anxiety and Stress scale-21) to measure the emotional states of depression, anxiety, and stress have been taken before the intervention and on the 21st day of intervention to assess the effects of the yoga protocol.

RESULTS: A significant reduction was observed after 21 days of intervention in 32 participants and the mean levels of depression anxiety, stress, and symptoms control were significantly lower (all values $p < 0.05$).

CONCLUSION: The practice of shatkriya and bhastrika pranayama helps to ward off mild and moderate level of asthma symptoms and improved quality of life.

KEYWORDS: Bronchial asthma, Jala Neti, Nasal Irrigation, Kunjal Kriya, Voluntary Induced Vomiting. Kapalbhathi, Bhastrika Pranayama, Bellow breathing. High-Efficiency Yoga Breathing, Shatkriyas, Cleansing Techniques

I. INTRODUCTION

The Global Initiative for Asthma (GINA) considers bronchial asthma as a complicated and multifaceted condition that is often characterized by persistent airway inflammation. It is characterized by the typical respiratory symptoms such as dyspnea or shortness of breath, wheezing, chest tightness, and cough that changes in intensity over time, along with fluctuating expiratory airflow limitation (Reddel et al., 2015). Asthma was predicted to impact 262 million people worldwide in 2019, translating to an age-standardized rate of 3416 cases per 100,000 people, according to the Global Burden of Disease Study (GBD). Global Asthma Report 2022 given by Global Asthma Network suggests that around 35 million of India's 1.36 billion populations have asthma. Ineffective management of asthma, especially the dependency on reliever medication rather than preventer medication is resulting in avoidable asthma deaths. Asthma claims more than 1000 lives every single day this needs to be rectified ("The Global Asthma Report 2022," 2022). Asthma prevalence has grown over time, just like that of other allergic diseases. 100 million more people globally are predicted to suffer from it by 2025.

Corticosteroids, short-acting β_2 -agonists for acute symptoms, and long-acting β_2 -agonists are all common inhalation therapies for persistent asthma. Asthma specialists agree that effective treatment can be accomplished by accurately determining the severity of the patient and then properly prescribing these medications, including medicines that inhibit proteins involved in the pathogenesis of asthma (Diagnosis and Management of Asthma in Adults: A Review | Allergy

and Clinical Immunology | JAMA | JAMA Network, n.d.). This conventional management of asthma only provides palliative care instead of providing a cure and hence, the number of asthmatics patients is increasing. Moreover, these standard inhalation treatments have side effects particularly when taken in large amounts. They negatively affect the HPA-axis (Hypothalamic-pituitary-adrenal axis) and give rise to problems like glaucoma, cataracts, skin lesions or even osteoporosis (Systemic Side Effects of Inhaled Corticosteroids in Patients with Asthma - ScienceDirect, n.d.).

A variety of non-pharmacologic techniques are becoming more and more used in the effective management of asthma. Yoga Therapy is one form of traditional CAM that seeks to restore equilibrium to the organism as a whole (Lack et al., 2020). Individual studies report beneficial effect of yoga in physical and mental well-being, indicating that it can be used as non-pharmacologic methods or complement to conventional therapy for treatment of all dimensions of health, i.e. physical, mental, social, and spiritual (Taneja, 2014). Yoga brings changes in the body by purifying it completely and this is what Maharishi Patanjali elaborates –“Yoganganusthanaadashiddhiksaye Jnanadiptiravivekakhyateh” (2.28- Patanjali yogasutra).

The ultimate goal of Yoga is the expansion of human capabilities as mentioned in Hath Yoga texts. Hath Yoga protects the practitioner and devotee of Hath yoga practice from the burning heat of three tapas 1.10- Hathpradeepika). Asthma or Tamak shwas is a problem that takes place due to the imbalance in vata and Kapha doshas (Baheti et al., 2017). The traditional texts of Hath yoga explain that a variety of yogic practices flushes the mucus out of the body. Swami Swatmaram, the author of Hathpradeepika, suggest that one should practice shatkriya or cleansing techniques in case of excess fat or phlegm in the body so that prana can smoothly flow throughout the body (2.21). These practices specifically work to balance the constituents (like three humors or tridoshas) of an individual. It has also been said about Bhastrika pranayama that it alleviates the excess mucus out of the body (2.59- Hathpradeepika).

Most previous studies have focused on High efficacy breathing techniques or Jala neti. Regardless of a practitioner's flexibility, there are many additional basic yoga practices that may be done by people of all ages. However, these components of yoga are least explored scientifically. The objective of the current study is to understand and scientifically explore the effect of selected Shatkriyas practices and Bhastrika pranayama on symptoms and quality of life in patients with mild to moderate asthma.

II. MATERIAL AND METHODS

2.1 Study Design

This pilot study was a prospective randomized controlled study conducted on patients with diagnosed mild to moderate asthma. The study was conducted in the Patanjali wellness center, Haridwar in North India's Uttarakhand state. ACQ was used to measure asthma control and DASS-21 (Depression, Anxiety, and Stress scale -21) was used to measure the emotional states of depression, anxiety and stress. This study employs pre-post interventional studies. The pre data was collected prior to the intervention and post data was gathered on the 21st day of the intervention.

2.2 Subjects

Patients at Patanjali Wellness Center, diagnosed with mild to moderate asthma, between 25 and 70 years of age were selected. Exclusion criteria were patients with severe asthma symptoms, current smokers, patients with chronic conditions other than asthma such as high BP, ulcers, diabetes mellitus, pregnant ladies and lactating women. 32 patients (16 males and 16 females) who fulfilled the inclusion and exclusion criteria were recruited. All the subjects practiced the intervention program for 21 days under the guidance of yoga professionals.

2.3 Intervention

Kunjala Kriya: Kunjala is also known as Vaman Dhauti or therapeutic voluntary induced vomiting mentioned in Gherand Samhita, involves the stimulation of vomiting reflex through the activation of the emetic center located in the medulla oblongata of the brainstem. In this practice, a large amount of lukewarm saline water is consumed quickly. This water in the stomach stimulates the stretch receptors in the stomach wall which results in the activation of the vagus nerve that relays signals to the emetic center in the brain. This emetic center then coordinates a series of the muscular contractions involved in the act of vomiting. Regular practice of this technique aids in balancing Kapha dosha (1.39 – Gherand samhita) and promotes vitality, lightness and clarity as it eliminates impurities accumulated in the oesophagus and the adjacent organs i.e. respiratory tract. All the patients were trained to complete the entire process of kunjala kriya within 7 minutes.

Jala Neti: After kunjala kriya, the intervention of nasal irrigation for 5 minutes was given to the patients. Saline water was poured into one nostril and drained out through the other nostril and vice-versa. Irrigation of both the nostrils clears

the nasal passages, reduce nasal congestion, and improve breathing. Neti is the cleaner of the brain and mitigates all the diseases of the cervical and scapular regions (2.30 – Hathpradeepika). The process of osmosis slowly drains slesma from the sinuses.

Kapalbhati: This most popular cleansing technique involves the forceful exhalations through the nose and passive inhalations. Patients were asked to practice kapalbhati for 10 minutes. After nasal irrigation, practicing kapalbhati dries out all the stagnant water in the nasal passages. Most importantly, it dries up all the disorders from the excess phlegm (2.35 –Hathpradeepika).

Bhastrika Pranayama: All the subjects practiced Bhastrika pranayama or Bellow breathing for 10 minutes that involves forceful, deep, and rapid inhalations and exhalations that generates heat in the body. This helps to reduce the feeling of sluggishness and balance the kapha dosha and Vata dosha (2.65 – Hathpradeepika).

Guided Relaxation: The practice of guided relaxation is added at the end of the yoga intervention. All the patients were instructed to lie down on the floor in the supine posture and follow the instructions of the yoga instructor. Instructions as based on the guidance on how to relax their entire body and mind. The only purpose was to turn their calm mind inward after the practice of pranayama.

Yoga module - list of practices for intervention

Table-1

S. NO.	Practices	Duration
1.	Kunjal Kriya	7 min.
2.	Jala Neti	5 min.
3.	Kapalbhati	10 min.
4.	Bhastrika Pranayama	10 min.
5.	Guided Relaxation	8 min.

All the practices proved highly efficacious in treating patients with mild to moderate asthma. Most importantly, all the five practices could be practiced by people of all ages, even those with high Body Mass Index or stiffed body precluding any ability to do yoga asanas. The key finding of the study is that there were no dropouts. Numerous participants said they enjoyed the intervention protocol and kept up the practice of yoga after reaching home. Zero dropouts is a significant accomplishment because lowering dropout rates was a key factor in the design of the yoga module.

2.4 Statistical Analysis

The mean and standard deviation (SD) were used to present quantitative data that was normally distributed. The pre-post data of the study group were analyzed using Paired T test. A p-value of less than 0.05 was considered as significant for each outcome. SPSS version 20 was used to analyze the entire data that was entered into Microsoft Excel.

III. RESULTS

Statistical analysis of pre-post data of asthmatics patients

Table -2

Domain	Pre-Data Mean ± SD	Post- Data Mean ± SD	t-value	p-value
Depression	10.47 ± 2.603	7.63 ± 1.862	9.878	0.000
Anxiety	10.34 ± 2.813	7.21 ± 2.776	11.496	0.000
Stress	8.69 ± 1.768	7.31 ± 1.942	5.921	0.000
Symptoms Control	16.88 ± 1.755	12.19 ± 1.693	19.241	0.000

The 32 participants on the first day before the intervention had depression (M=10.47, SD 2.603), Anxiety (M=10.34, SD 2.813), Stress (M=8.69, SD = 1.768), and Symptoms control (M= 16.88, SD 1.755) compared to the 32 participants who received Yoga intervention for 21 days were found Depression (M=7.63, SD=1.862), Anxiety (M=7.31, SD=2.776), Stress (M=7.31, SD=1.942) and Symptoms control (M=12.19, SD 1.693). A significant reduction was observed and the mean levels of depression anxiety, stress, and symptoms control were significantly lower (all values $p < 0.05$).

IV. CONCLUSION

A large number of the previously published study shows that yoga has a huge impact on the overall well-being and quality of life of humans. This is the first study to demonstrate the impact of cleansing techniques or Shakti on people with mild to moderate asthma symptoms. The depression, anxiety, stress, and symptoms severity is reduced significantly after the selected cleansing techniques and Bhastrika pranayama intervention for 21 days. Indulging in the practice of internal cleansing and pranayama practice on daily basis may hold the key to alleviating asthma symptoms gracefully and promoting physical, mental, and reproductive health and longevity.

V. DISCUSSION

The human takes breathe 21600 times a day according to ancient literature (e.g., Goraksha Samhita). The whole respiratory system is exposed to different kinds of microorganisms and pollutants and is at higher risk of a variety of infections and inflammation. Due to the polluted environment and sedentary lifestyle human is not able to save themselves even if they wanted to. Today, there is no doubt that a large number of people are suffering from asthma. It has been observed that individuals who have recovered from COVID-19 or who took vaccines experience persistent respiratory symptoms and complications.

Jala Neti, Kunjala Kriya and widely popular Kapalbhathi are among six purificatory measures to be utilized by yoga practitioners for inner and outer purification, Bhastrika pranayama is mentioned in hath yoga that alleviates problems caused by Kapha dosha. All these practices remove accumulated mucus from the nostrils, associated passages, and sinuses, allowing air to flow without obstruction. All these practices exert a profound physiological and psychological effect on the body, mind, and personality. In modern medical science, a wide range of medicines, for example, rescue inhalers, bronchodilators, steroids, and anti-inflammatories are available for the treatment of Bronchial asthma. These medications help in eliminating the symptoms only and provide temporary relief whereas the treatment means to eliminate the root cause of the problem. Additionally, many complications are associated with the use of these conventional medicines.

Studies have investigated the effects of Shatkarma and pranayama on the parameters of the symptoms and quality of life in individuals with mild to moderate levels of bronchial asthma (Sangeethalaxmi & Hankey, 2022). These studies have reported positive outcomes such as reduced symptoms and enhanced quality of life, and decreased use of bronchodilators and other conventional medications. It is important to note that these effects may be mediated through various mechanisms including relaxation, stress reduction, improved breathing patterns, and overall respiratory muscle coordination.

Regarding broncho-constrictor neurotransmitters, such as acetylcholine, histamine, and leukotrienes, there is limited research specifically exploring the impact of pranayama practices on their levels or modulation. The potential effects of cleansing techniques and pranayama practice on these neurotransmitters may be an interesting area for future research.

LIMITATION: This study was only a pilot study and the sample size was also less.

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