

THE ROLE OF YOGA THERAPY IN THE MANAGEMENT OF BRONCHIAL ASTHMA (TAMAKA SHWASA)

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Received: 20 August 2019, Revised and Accepted: 01 October 2019

ABSTRACT

Objective: The present study was conducted on patients taken from *Swasthavrutta* department of Gujarat Ayurved University in Jamnagar town, Gujarat. The study was done with an objective of providing a safe and reliable as well as cost-effective natural management of symptoms occurring in patients of bronchial asthma. This is also done to reduce the various harmful effects of modern medicines among the patients and to reduce the use and dependency on inhalers.

Methods: Thirty-two patients with bronchial asthma (*Tamaka Shwasa*) underwent training for 16 weeks in an integrated set of yoga exercises, including prayer, strengthening exercises, *Yogasanas* (including standing *Asana*, prone *Asana*, sitting *Asana*, and supine *Asana*), *Pranayama* (*Nadi Shodhana*, *Ujjayi*, *Bhramari*, and *Aumkara Dharana*), and *Shuddhi Kriya* (to be done once in a week) which includes *Kunjla*, *Sutraneti*, and *Kapalabhati*. The patients were told to practice these exercises for 60 min daily.

Results: Significant improvement was seen in the patients who undergone yogic interventions. There was significant improvement in the duration of *Shwasakashata*, frequency of *Shwasakashata*, reduction in taking number of emergency medicine, *Pinasa*, *Kaphashtheevana*, cough, *Ghurghuraka*, orthopnea, *Parshvashula*, *Lalate Sweda*, result on peak expiratory flow rate, airway exchange catheters, oxyhemoglobin saturation, and chest expansion.

Conclusion: From the study, it can be concluded that *yoga* practices can be opted as long-term management of bronchial asthma, but its beneficial effects need to be studied in more details on large sample size.

Keywords: Bronchial asthma, *Tamaka Shwasa*, *Yoga*, *Pranayama*.

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INTRODUCTION

Bronchial asthma is one of the chronic inflammatory diseases of the airways. It is commonly associated with an airway hyperresponsiveness which leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing mainly at night or in the early morning [1]. Among various etiopathogenic features of asthma, increased vagal tone is one among them [2]. According to the Global Asthma Report (2014), asthma symptoms such as breathlessness usually lead to the feeling of fear, emotional, and psychological suffering in asthma patients. The stigma associated with the diagnosis of asthma is among the major obstacles in course of better asthma management [3]. *Yoga* and *Pranayam* practices adjust the autonomic imbalance, control the rate of breathing, and thus alter various physiological variables. They also have their impact on the psychological status of the asthmatic patient and help in reducing the stigma associated. These changes are mainly due to decreased sympathetic reactivity and relaxation of voluntary inspiratory and expiratory muscles [4]. Various studies have been conducted on the effect of breathing techniques in asthma. Various scholars have reported improvement in asthmatic patients with the use of various *yogic* breathing exercises [5-7]. With the aim of improving the quality of life of asthmatic patients by intervening them into various *yoga* practices, the present study was conducted.

METHODS

The study was conducted at the *Swasthavrutta* department of Gujarat Ayurved University in Jamnagar town, Gujarat. A clinical

trial, controlled prospective study was conducted on 32 patients by intervening into *yoga* practice everyday for 60 min for 16 weeks by a yoga trainer. Of 32 patients, 30 completed the trial and 2 left against medical advice.

The *yoga* practice includes:

1.	Prayer	5.0 min
2.	<i>Strengthening exercises (sakti vikasaka sukma vyayama)</i>	10 min
	<i>Greeva Shakti Vikasaka Prathama,</i>	5 rounds
	<i>Dwitiya, Trutiya</i>	
	<i>Vakshasthala Shakti Vikasaka Prathama, Dwitiya</i>	5 rounds
	<i>Udara Shakti Vikasaka Prathama, Dwitiya, Trutiya</i>	5 rounds
3.	<i>Yogasanas</i>	30.0 min
	<i>Standing Asanas:</i>	10 min
	<i>Tadasana, Urdhva hastottanasana, Ardha Chakrasana, Katichakrasana</i>	
	<i>Prone Asanas</i>	5.0 min
	<i>Bhujangasana, Dhanurasana</i>	
	<i>Sitting Asanas</i>	10 min
	<i>Ushtrasana, Shashankasana, Uttanamandukasana Gomukhasana, Ardha Matsyendrasana/Vakrasana</i>	
	<i>Kapalabhati</i>	

	<i>Supine Asanas</i>	5.0 min
	<i>Uttanpadasana, Ardhalasana, Viparita Karani/Halasan, Setu Bandha Sarvangasana, Matsyasana, Shavasana</i>	
4.	<i>Pranayama</i>	15 min
	<i>Nadi Shodhana, Ujaayi, Bhramari, Aumkara Dharana</i>	
5.	<i>Shuddhi Kriya: (to be done once in a week) Kunjal, Sutraneti, Kapalabhati</i>	
	Total duration	60 min

Inclusion criteria

- Belonging to the age group of 24–60 years
- Had the sign and symptoms of bronchial asthma (*Tamaka Shwasa*) as given below:
 - *Shwasa Kashtata* – Breathlessness
 - *Kasa* – Coughing
 - *Parshvashula* – Pain in flanks
 - *Ghurghurakam* – Wheezing
 - Feeling of chest tightness/compression
- Uncomplicated cases of bronchial asthma
- Chronicity <10 years
- Willing and able to participate as well as understanding and affirming to sign written consent for the treatment schedule of the concerned study.

Exclusion criteria

Patients falling under the following criteria were excluded from the study:

- Age below 24 years and above 60 years
- Patients who were had thrombosis, stroke, and other severe abnormalities such as cardiac disease, renal disorders, acquired immunodeficiency syndrome, endocrine disorders such as diabetes mellitus, thyroidism, etc.
- Patients who had other complicated respiratory diseases, i.e., swine flu, tuberculosis, chronic obstructive pulmonary disease, etc., and had any organic lesion such as tumor or any anatomical defect in the airways were excluded from the study.

The study was approved by Scientific Committee of ACYER and the Ethical Committee of University, and according to the Guidelines of Morarji Desai National Institute of Yoga, some changes were being incorporated.

Participants were given information about the study objective, voluntary participation, and were told about their treatment. They were also told about the activities that were going to be practiced and were also informed as they could withdraw from participation at any stage. Those patients who had signed the consent form participated in the study.

Statistical methods

Paired “t” test was used for the subjective and objective parameters.

RESULTS

Thirty-two patients who fulfilled the inclusion criteria and signed the consent were taken for the study. As 30 patients completed the trial, so, observation of 32 patients and the results of 30 patient’s statistical analysis are given below.

Most of the patients in the study showed a decreased number of day attacks per week and night attacks per month ($p < 0.05$). The mean change in the peak expiratory flow rate (PEFR) was 0.52 which was statistically significant ($p < 0.05$). The mean change in the asthma control questionnaire was 6.56 which was statistically significant ($p < 0.001$). Similar pattern was also observed in the mean change of pulse oximetry, chest expansion, absolute eosinophil count, and other symptoms ($p < 0.001$).

DISCUSSION

In the observations of 32 patients of *Tamaka Shwasa*, maximum number of patients, i.e., 31.25%, were belonging to the age group of 31–40 years and 51–60 years, 56.25% were of male sex, and 40.62% patients were housewives.

This study showed a reduction in the number of asthma attacks which is comparable to the previous research work [7,8].

The improvement in PEFR in this study is also comparable to the previous studies [7].

This explains the effect of *yoga* in the relief of asthma attack and improves the quality of life. The responsiveness of air ways is noticeably increased in asthma patients so that they develop bronchoconstrictions for smaller amount of physicochemical stimuli than the healthy ones. There is a complex interplay of several factors, namely inherent responsiveness of smooth muscles, abnormality in autonomic nervous control, and breakdown in airway defence may promote bronchial hyper reactivity. Hence, reducing the hyperresponsiveness of the patients will benefit them to have good outcome in the control of their asthma.

The other way is the psychological effect on asthma progression, though the mechanism is complex and not well understood; still psychological factors affect about half of all patients. This was the focus pointed to be improved by the *yoga* exercise and showed improvement in different studies [7].

Mode of action of various *yoga* practices

- *Greeva Shakti Vikasaka Prathama, Dwitiya, and Trutiya* as shown in Fig. 1 increase vitality and improve sleep, vision, and hearing. This will help to remove excessive *Kapha* from the upper part, as it is the seat of *Kapha*. Increased blood circulation and nervous supply will help to relax constricted bronchial tubes, thus patients get relief by this *Kriya*. This *Kriya* corrects the energy flow to *Vishuddhi Chakra* which improves *Akashtatva* balance and congestion of lungs, thus helpful in bronchial asthma.
- *Vakshasthala Shakti Vikasaka Prathama, Dwitiya, and Trutiya* as shown in Fig. 1 strengthen chest muscles. Due to chest expansion, the lungs will fill with sufficient amount of air. Increased lungs capacity will help to cure bronchial asthma by more oxygenated air flow to system. *Anahat Chakra* gets sufficient pranic flow, which channelizes *Vayu* and removes congestion from *Nadies* of lungs, thus helpful in bronchial asthma.
- *Udara Shakti Vikasaka* as shown in Fig. 1 strengthens the abdominal muscles, helps to decrease abdominal fat, and helps to remove diseases of abdomen, as well as of respiratory system. Due to weak abdominal muscle, complete breathing cannot take place which affects respiratory system. This *Kriya* helps to correct the breath by strengthening abdominal muscles. *Manipur Chakra* is activated by this *Kriya*. Active pranic flow to *Manipur* increases *Agnitatva*, which improves digestion. As per *Ayurvedic* concept Bronchial Asthma is *Pittanubandhi*, so balanced *Agnitatva* balances *Pitta* in the system and thus helpful in bronchial asthma.

Standing Asanas

Tadasana

It improves respiration and promotes balance in the spine which can aid in proper breathing. *Prana* flows sufficiently in all *Chakras* due to balanced spine. Congestion of *Kapha* is also removed by stretching of the entire body because of gravity. It corrects the body posture too. It helps to activate the apex portion of the lungs also, thus helpful in bronchial asthma.

Urdhva hastottanasana

It improves air exchange in the lungs and thus the overall lung capacity improves. Increases thoracic mobility and helps chest expansion. Aligns the body and corrects the body posture, strengthens waist muscles

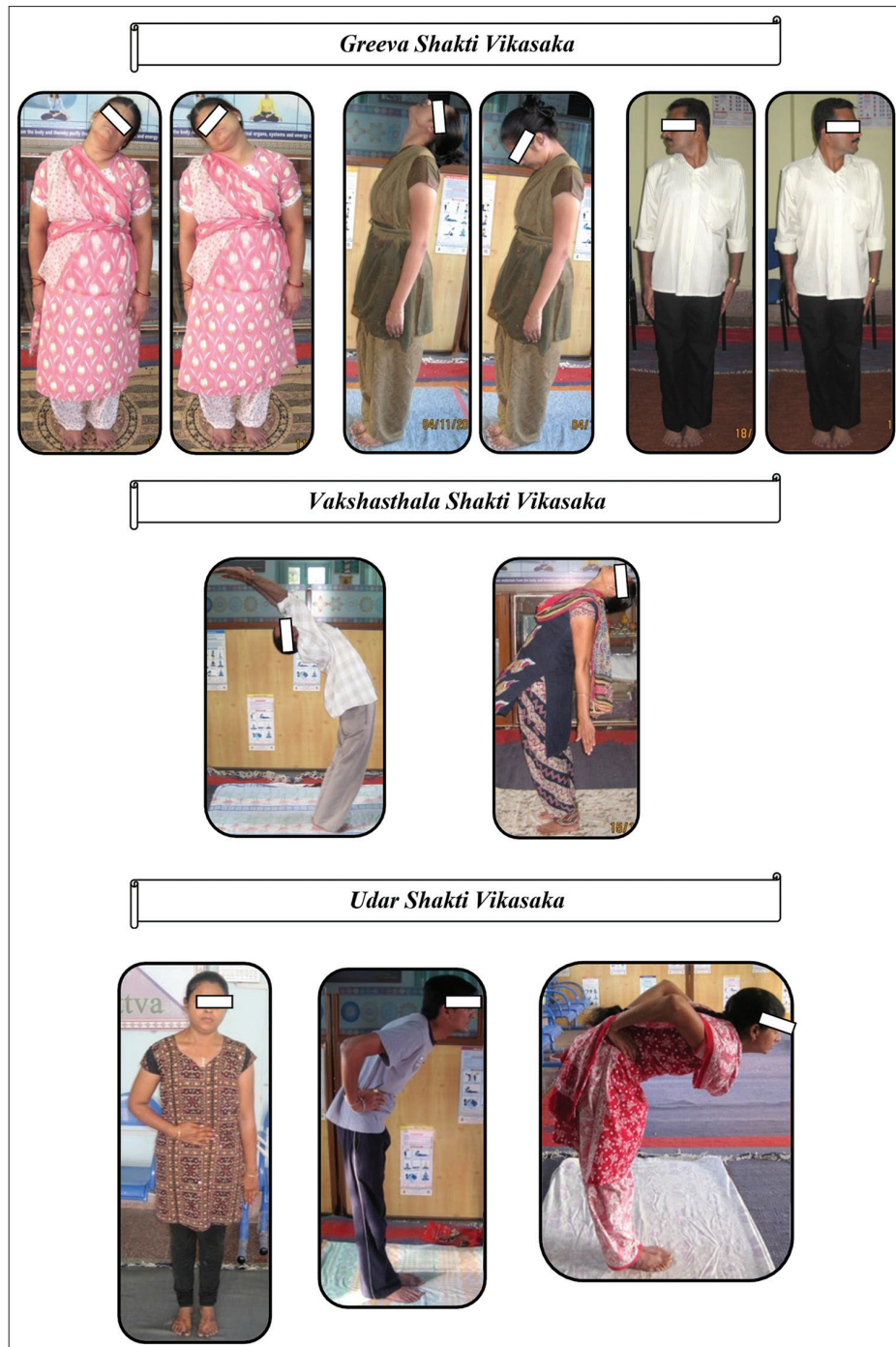


Fig. 1: Strengthening exercises

which improves digestive fire, channelizes *Vata*, and removes *Kapha* from *Nadis*, thus helpful in bronchial asthma.

Ardha Chakrasana

It strengthens and tones the muscles of the chest, back, and arms. The expansion of the rib cage aids respiration. Spine will be flexible due to backward bending. *Prana* flows easily from *Manipoor Chakra* to *Vishuddhi Chakra*. This *Pranic* energy will help to channelize the *Vata* in *Nadis* of the chest; thus, relaxed bronchioles give relief to the patient, likewise helpful in bronchial asthma.

Katichakrasana

It gives rotation to thoracic spine and stretches the chest muscles which leads to expansion of the ribcage and improves air exchange in

the lungs. Improved respiration helps to remove *Kapha* from lungs and channelizes *Vata*, thus helpful in bronchial asthma.

Prone asanas as shown in Fig. 2

Bhujangasana

It stretches the chest, shoulders, and abdomen, firms the buttocks, and stimulates abdominal organs. It also helps to relieve stress and fatigue and helps the heart and lungs to work properly. Lung capacity is enhanced. It stimulates *Mooladhara* and *Swadhishtan Chakra* which corrects *Vata* vitiation and *Kapha Dushti* by balancing *Pruthvi* (Earth) and *Jala-tatva* (water). Abdominal stretching will stimulate *Manipura Chakra* and corrects *Agni Dushti*. *Anahata* and *Vishuddhi Chakra* are opened by chest expansion, which channelize *Vata* and increase *Aakashatva* thus by balancing *Panchtatva* helpful to cure bronchial asthma.

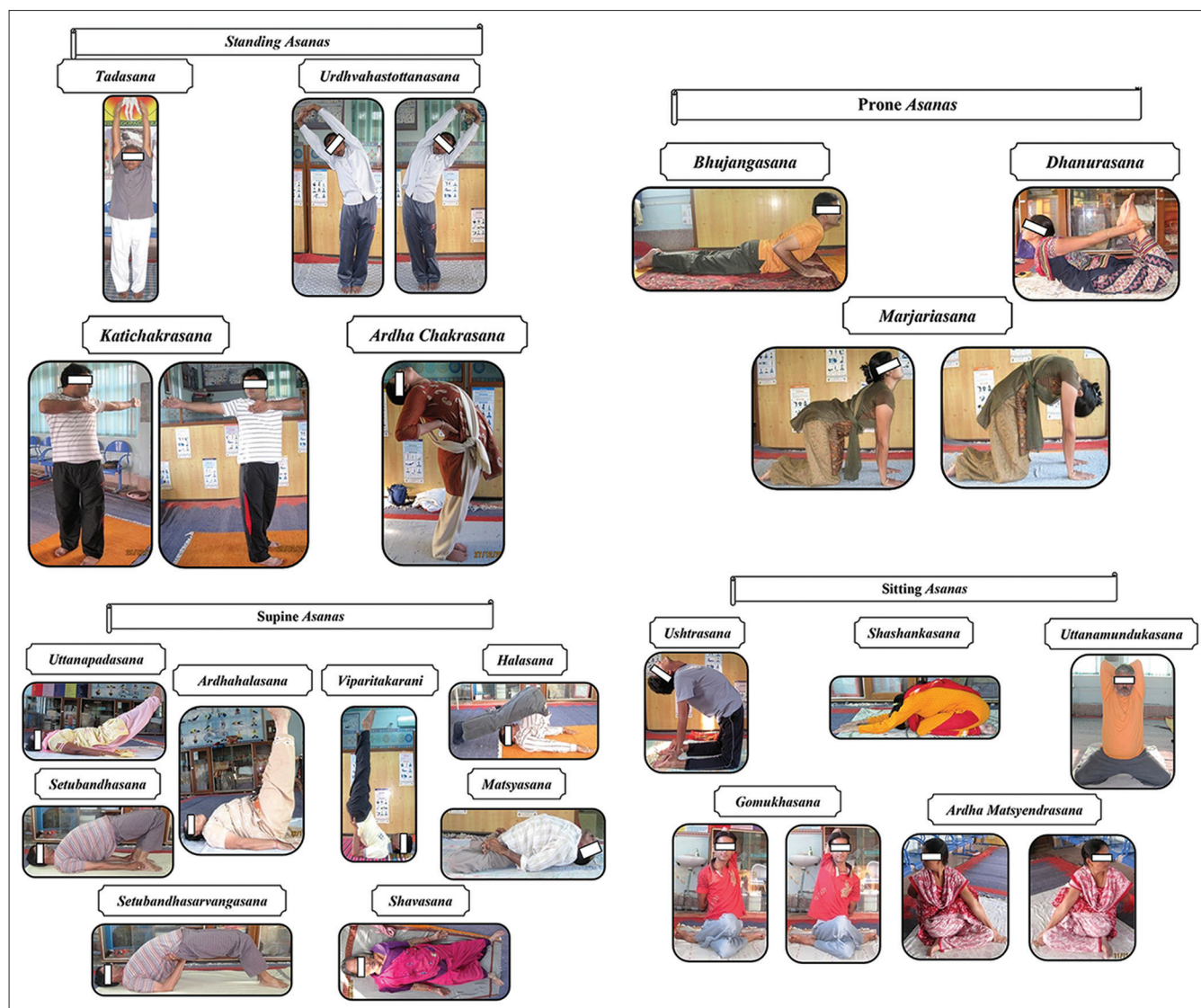


Fig. 2: Yogasanas

Dhanurasana

It tones up and stimulates the organs of the chest and abdomen. It stretches the chest muscles. Increases circulation to heart and lungs, improves oxygen intake, stretches the diaphragm, and expands the chest region – improves respiratory conditions. Due to spinal curve from top to bottom, each *Chakra* gets sufficient Pranic flow which removes *Kapha* and channelizes *Vata* from *Nadis* of *Vaksha*, thus helpful in bronchial asthma.

Marjarasana

It releases tension from the cervical, thoracic, and lumbar spine and makes lungs stronger. It gives initiate movement from the center and co-ordinate movements and breath. The relaxation of then spine with breathing improves *Pranic* flow to each *Chakra*, and correction of breath helps to cure bronchial asthma.

Supine asanas as shown in Fig. 2

Uttanapadasana

It bolsters health of digestive organ, lungs, heart, stomach, liver, spleen and intestine counters constipation. Excellent pressure on the abdomen cures *Agni Dushti* by stimulating *Manipoor Chakra* and improves digestion which corrects *Malayukta Kapha* production. A good stretch at the lumbar spine helps to activate *Mooladhar Chakra*, which relieves constipation and *Vata*, thus helpful in bronchial asthma.

Ardhalasana

Stretching of hamstring and calf muscles and strengthening of lower abdomen improves digestion. Position of legs will increase blood circulation toward the upper part, which provides more nourishment to the chest and lungs. The relaxation of the legs in the final position helps gravity to flow *Samana-Vayu* easily and diverts *Apana-Vayu* from the lower extremities. Hence, *Vata Prakopa* is corrected and asthmatics get relief.

Viparita Karani/Halasana

It increases the blood flow to the face, neck, and thorax and improves the functioning of adrenal, pituitary, and thyroid glands. This posture diverts Pranic flow to each *Chakra*. It drains secretions toward main airway path/trachea to be thrown out. This brings balance normalize the functions of *Vata* and activates *Manomayakosha*. These will soothen the mind, which is helpful to cure such psychosomatic disorder like B.A.

Setubandhasana

It strengthens the spine and improves spinal flexibility. Lower back and hip extensor muscles' strengthening improves lumbar curvature and gives stability to lumbosacral etc., improving alignment of LOG. Expansion of the chest improves breathing capacity. This *Asana* affects *Manipoor*, *Anahat*, and *Vishuddhi Chakra*, which corrects *Agni Dushti* and channelizes *Vata*, thus helpful in bronchial asthma.

Matsyasana

It stretches the muscles between the ribs (intercostals), makes it more functional, fills the lungs with air, and increases the lung capacity. As the larynx or wind box and trachea (wind-pipe) are thrown open widely, this *Asana* helps deep breathing. The effect of this *Asana* is seen in all the *Chakras* from *Muladhar* to *Vishuddhi*. Because of this *Asana*, all the *Nadis* i.e *Nerves* and channels become activated and *shuddha* (clear and pure). This brings balance and normalizes the function of all *Vata* and thus helpful in bronchial asthma.

Shavasana

The posture of this *Asana* affects the center of gravity, so the front portion of all *Chakras* is opened and energy balance of the body is improved. As it relaxes the body, *Rajas* and *Tamas* are destroyed consciously. The function of all *Nadis* improved, thus helpful to cure such psychosomatic disorder such as bronchial asthma.

Ushtrasana

It expands the lungs to their maximum capacity, develops the ribcage, and brings a good effect upon the whole of respiratory system activating the facial tissues, the nasal passage, the pharynx, the lungs, and the whole of respiratory organs and the nerves. Expansion leads to increase ventilation of the alveoli, thus helpful to cure bronchial asthma.

Shashankasana

It activates the adrenal gland and leads to more adrenaline being secreted when done for a longer duration. This being posture where forward bending is practiced will relax the abdominal muscles, stretch the back muscles, and allow the diaphragm to extend easily downwards; thus, it will help in respiratory problems such as bronchial asthma.

Uttanamandukasana

It improves the lung potency and circulation in the walls of the chest. Expansion leads to increased ventilation of the alveoli, as it affects *Anahat* and *Vishuddhi Chakra*. *Prana* flows freely in this *Chakras* due to raised hands in an upward direction, thus helpful to cure bronchial asthma.

Gomukhasana

It strengthens the muscles of the upper back, upper arms, shoulders, chest, hips, and thighs, improves lung function, and helps to overcome respiratory problems. Expansion of the chest leads to increased air exchange to the basal region of lungs, thus helpful to cure bronchial asthma.

Ardha Matsyendrasana

It is a great help for the bronchial muscles and rib cage and tones the belly muscles, and therefore, abdominal, respiratory, and cardiovascular organs are also exercised and their functioning improves. As it gives rotation to the thoracic spine and stretches the chest muscles, it leads to the expansion of the ribcage and improves air exchange in the lungs. *Prana* (Oxygen) flows easily in all *Chakras* due to spinal curvature and *Nadis* (Nerves) of front portion are activated and become *shuddha* which is helpful in bronchial asthma.

Vakrasana

It is a great help for the bronchial muscles and rib cage. It tones the belly muscles, and therefore, abdominal, respiratory, and cardiovascular organs are also exercised and their functioning improves. As it gives rotation to thoracic spine and stretches the chest muscles, it leads to the expansion of the ribcage and improves air exchange in the lungs, thus helpful in bronchial asthma.

Shuddhi Kriya as shown in Fig. 3**Kapalabhati**

It cleanses the lungs and entire respiratory system by detoxifying them. The blood is purified as well and the body gets an increased supply of



Fig. 3: Shuddhi Kriya

oxygen to all cells. It directly affects on *Ajnachakra* as suggested by its name *Kapalabhati* (shines forehead). Due to active abdominal movement, *Manipoor Chakra* is also activated, which improves the function of *Agni*. Removal of *Kapha* channelize the *Vata* in *Nadis* (Nerves) and it will help to cure bronchial asthma.

Pranayama as shown in Fig. 4**Bhastrika**

It removes *Vata*, *Pitta*, and *Kapha* from body and increases the body fire. It removes *Malayukta Kapha* from the lungs easily. Pumping movement of the lungs will increase lung capacity; thus, correction of the entire respiratory system easily cures bronchial asthma.

Nadi Shodhana

It lowers heart rate and reduces stress and anxiety. It is said to synchronize the two hemispheres of the brain and to purify the subtle energy channels (*Nadi*) of the body; hence, the *Prana* flows more easily during *Pranayama* practice, clears the respiratory passage, and strengthens the lungs.

Ujjayi

It is most effective for correcting and strengthening the condition of the lungs and the bronchiole linings.

Bhramari

Concentration on humming sound will calm down and soothes the mind. It relieves mental stress and anxiety. It increases pain tolerance, thus helpful in bronchial asthma.

Aumkara

This stimulates the secretion of serotonin, nor-epinephrine, and dopamine, thus relieves mental stress and improves the psychoneuroimmune response. The vibration of *AUM* rapidly relaxes



Fig. 4: Pranayama

Table 1: Sociodemographic characteristic of asthmatic patient

Sociodemographic features	Frequency
Sex	
Male	18
Female	14
Age	
21-30	05
31-40	10
41-50	07
51-60	10
Occupation	
Labor	01
Service	09
Business	09
Housewife	13

Table 2: Mean changes in the subjective and objective parameter before and after the yoga exercise

Parameters	Mean changes	* p value
<i>Shwasakashtata</i> – frequency	01.66	<0.001
<i>Shwasakashtata</i> – duration of attack	01.89	<0.001
No. of emergency medicine taken	01.28	<0.001
<i>Kasa</i> (coughing)	01.04	<0.001
<i>Kapha Sththivanam</i> (expectoration)	01.09	<0.001
<i>Ghurghurkam</i> (wheezing)	01.34	<0.001
Asino Labhate Saukhyam	01.65	<0.001
<i>Pinasa</i> (rhinitis)	01.04	<0.001
Chest tightness	01.37	<0.001
<i>Parshvashula</i> (pain in flanks)	01.26	<0.001
<i>Lalate Sweda</i> (perspiration on fore head)	01.68	<0.001
<i>Bhrama</i> (giddiness)	01.00	<0.010
Peak expiratory flow rate	00.52	<0.050
(SpO ₂) by pulse oximetry	01.07	<0.001
Absolute eosinophil count	87.84	<0.001
Chest expansion at the level of nipple	02.85	<0.001
Asthma control questionnaire	06.56	<0.001

the mind and body. It quickly brings mental peace and helps to prevent psychosomatic disorder such as bronchial asthma.

Dharana

This is an excellent method to overcome the problems, conflicts, and other disturbances hidden in the mind and relaxes body – mind too. It increases regenerated capacity of individual. Concentration on *Anahata* and *Vishuddha* Chakra along with the *Japa- Aum* chanting will help to cure such psychosomatic disorder such as bronchial asthma.

Shuddhi Kriyas: (to be done once in a week) as shown in Fig. 3

Kunjaj

It strengthens solar plexus cleanses and stimulates the stomach, esophagus, lungs, chest, heart, throat, nose, eyes, ears, and sinus, and hence, it is very beneficial for asthmatics. The strong contractions made by the pyloric sphincter send a shock wave along the Vagus nerve which can release the spasm within the bronchial tree.

Sutraneti

It does a frictional massage that strengthens the membranes enabling them to work more efficiently in their function of warming, cleaning, humidifying, and disinfecting the air. Furthermore, the blood supply to the nerves of the air passages is energized enhancing the effects of any subsequent breath work. It excels in removing Catarrh and *Kapha*. Resistance to infection is improved. It also clears away dried up deposits and foreign bodies by stimulating fluid to help the flushing process. At a more subtle level, *Sutraneti* stimulates the *Ajna Chakra*.

Jalaneti

It helps to remove the mucous filled with dirt and bacteria and drains the nasal passages and sinus cavities. It helps to fight off infections leading to cold and *Kapha* and other allergy-related problems of the nose and upper respiratory tract such as bronchial asthma.

CONCLUSION

This study shows that *yoga* decreases the number of asthma attacks, the use of drugs, and improvement in the peak flow rate. We recommend

conducting large-scale study on the effect of *yoga* on asthma. Attempts should be made to instill positivity in asthma patients by community-ridden education campaigns to improve the lives of asthma patients, and patients can enjoy their psychosocially active life in the community [3].

CONFLICT OF INTEREST

None.

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