



## Developing a New, Improved Yoga Medicine Treatment for Asthma

**Sangeethalaxmi MJ and Alex Hankey\***

*Professor Emeritus of Biology, UK*

**\*Corresponding Author:** Alex Hankey, Professor Emeritus of Biology, UK.

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### Abstract

Bronchial asthma afflicts many millions of people worldwide, with over 4% of young adults found to be taking asthma medication in multinational studies. Prescribed medication may alleviate symptoms but does not cure. The complementary system of Yoga medicine has developed Yoga practice modules that improve symptoms, but are cumbersome, and lead to high dropout rates. Here we report the development of a new, shorter Yoga module that achieved zero dropouts over a ninety-day randomized controlled trial. All Yoga breathing exercises could be done standing or sitting in a chair, making it suitable not just for young adults but for all ages.

**Keywords:** Yoga; Asthma; Dropout Rate; Practice Selection; Clinical Benefits

### Introduction

Bronchial asthma is a world-wide scourge afflicting 300 million people [1]. WHO estimates that the prevalence of asthma in India is about 3% (42 million patients), with a prevalence of 2.4% in adults aged >15 years [2,3].

That number is believed to be on the rise. Much of the increase can be attributed to lifestyle. Sedentary lifestyle has now become the norm. Reduced physical inactivity and increased psychological stress are common. As a result, psychosomatic ailments are on the increase [4]. Bronchial asthma is one such ailment where psychological causes produce physical suffering [5,6].

The disease is characterized by chronic inflammation of the airways, resulting in overpopulations of eosinophils, mast cells, and activated T helper lymphocytes [7]. These cells release mediators that trigger bronchoconstriction, mucus secretion, and remodeling, permanently constricting the airways [8]. Many kinds of inflammatory mediators drive these processes, including cytokines, chemokines, growth factors, lipid mediators, immunoglobulins, and histamine [9].

Anti-asthmatic drugs available in the market are expensive for the Indian population; over the long term, most have adverse side-effects [10]. Adjunct therapies to alleviate such problems are therefore desirable [11,12].

Medically applied yoga, Yoga Medicine, has proved valuable [13], using yoga postures and stretches, breathing techniques, relaxation and meditation to treat asthma [14,15].

Clinical evidence suggests that modules of carefully selected yoga practices adopted as study protocols result in positive effects on asthma management. Nagendra., *et al.* 1985 [13] was a pioneer research study of yoga on bronchial asthma. Seethalakshmi., *et al.* 1991 [16] investigated Yoga - chair breathing for acute episodes of bronchial asthma. Vedanthan, 1998 [17] conducted clinical research on university students with asthma using various yoga techniques. In an RCT published in 2009 [15], Vempati., *et al.* studied the efficacy of a comprehensive yoga lifestyle modification programme in management of bronchial asthma. These studies suggested that Yoga improves quality of life and reduces rescue medication use in bronchial asthma, achieving the reduction earlier than conventional treatment alone. Bidwell., *et al.* 2012 [18] evaluated improvement in quality of life for women with asthma.

Significant decreases in numbers of asthma attacks [16] and drug treatment scores [19], and increases in pulmonary and autonomic functions [20] and quality of life [15] have all been observed in experimental groups practising yoga. Mindfulness training has also been found beneficial [21] Benefits of Yoga practice are not limited to asthma, they have also demonstrated benefits for back pain [22] cardiometabolic [23] and mental health [24,25], and other pathologies [26-28].

In these studies, drop-out rates have been high enough to detract from the clinical efficacy of the protocols. Most probably, that has been due to the amount of time required for practice each day. It was therefore decided to try to design a simpler yoga protocol for asthma and associated anxiety and depression, pulmonary function, and quality of life. The present study aimed to develop such a Yoga protocol, which, in addition to evaluating its clinical benefits for asthma patients, would pay close attention to drop-out rate, which it aimed to minimize.

**Materials and Methods**

Design of the new protocol was based on the following considerations.

In asthma, obstructed air flow in the trachea due to bronchial constriction, reduces diaphragmatic movement, lung function, and causes psychological stress like anxiety and depression [29].

Yoga practices selected for the new protocol were therefore targeted to reduce these key symptoms. Most importantly, they aimed to make the whole procedure as short as was practicable, and also easy in the sense of being done standing, or sitting in a chair. Then all ages could practice them, even those with high BMI.

Several years previous clinical experience of asthma patients led to testing various Yoga based procedures on individual patients. After formulation, the new protocol was tested on a small group of five patients. This established its practicality and basic efficacy for patients of all ages.

Information regarding the participants in that development study: how many, how severe was their asthma, age, gender, and if you have any information on how they liked the program.

There followed a randomized control trial on sixty patients, which is being reported elsewhere.

Sl. No	Severity	Age	Gender	Acceptance
A	Moderate	20	F	Vary
B	Moderate	29	M	Comments
C	Mild	37	M	
D	Moderate	59	M	
E	Severe	76	F	Yes

**Table 1:** Details of Subjects.

By these stages the new protocol has come to include the following:

- **Abdominal breathing:** To increase diaphragm elasticity, and lung volumes [30]
- **Vakshasthala Shakti Vikasaka Vyayama:** To strengthen the lung and bronchioles [31]
- **Kapalabhati:** To improve immunity and so decrease mucus production [32]
- **Bhastrika:** To improve overall lung functions and achieve bronchodilation [33]
- **Guided Relaxation:** To relieve stress and anxiety, and so calm the mind [34].

Next, the Yoga terms used above like Kapalabhati and Bhastrika are described.

**Rhythmic abdominal breathing**

A basic breathing practice for pranayama: It corrects breathing pattern of those habituated to wrong pattern or shallow breathing. It involves deep and slow breathing along with pulling the abdomen in with exhalation and expanding it out during inhalation. Practice lasted 5 minutes.

**Vakshasthala shaktivikasa vyayama**

**Procedure 1**

- **Posture:** Instructions were given to stand with the feet together, body erect, arms beside the body with palms turned inwards.
- **Exercise:** The practice began with swing the arms up and backwards, describing a semicircle along with the inhalation through the nose. The participants were asked to lean back as far as possible and remain in that position as long as possible while holding the breath. During exhalation, the arms slowly come down to their starting posture. Repeated a total of 5 times.

**Procedure 2**

- **Posture:** Instructions were given to stand with the feet together, body erect, arms beside the body with palms turned inwards.
- **Exercise:** The practice began with the inhalation through the nose and bending backward from the waist. At the same time, arms are stretched backward, expanding the chest. The participants were asked to maintain this posture as long as possible, while holding the breath.
- Exhalation was done while slowly resuming to starting posture. Repeated a total of 5 times.
- The entire practice is completed in 5 minutes.

**Kapalabhati**

Instructions were given to sit in sukhasana or vajrasana. As is normal, patients were instructed to practice passive inhalation followed by active exhalation. Breath frequency was aimed at 60 strokes per minute in groups of 30 followed by 5 to 10 seconds’ rest; practice lasted 5 minutes.

**Bhastrika pranayama**

Instructions were given to sit in sukhasana or vajrasana and to breathe in and out forcefully through the nose. They were asked to stretch the abdomen in and out rhythmically with the breath. This was done first through the left nostril twenty-five times, then through the right nostril 25 times, and then both nostrils 25 times. After this, a relaxation time of 10-15 seconds was given. This constitutes one round of Bhastrika Pranayama. Three rounds were done, about 10 minutes in total.

**Guided relaxation**

The subjects were asked to lie down in shavasana pose. Each part of the body starting from the top of the head, face, arms, back, chest, abdomen, hips and legs were asked to relax. They were further asked to practice deep breathing. They were told to imagine themselves breathing comfortably without any obstruction. After 5 minutes, they were requested to slightly move their fingers and toes, and then to slowly open their eyes.

**Results**

Drop-out rate reduced to zero. This may be attributed to the simplicity and ease of practice of the new protocol; also, to the fact that excellent clinical results were obtained within a month, so that participants could see their improvements, motivating them to continue their practice.

Details of these immediate clinical improvements are being reported elsewhere. They included significant gains in pulmonary functions, improved quality of life, and reduced anxiety and depression. They meant that participants much appreciated their practice of the yoga module.

**Discussion**

Most previous clinical studies of yoga therapy for asthma have employed protocols lasting 35 to 65 minutes [13,20,35-38]. Although they have, on the whole, produced good results, module length has resulted in drop-out rates of 10 to 20%. Factoring this into 1 assessments by adopting an Intention-to-Treat analysis, correspondingly reduces experimental 2 improvements observed in the clinical groups.

Sl.	Name	Like?	Practice at home?	Difficulty	Individual Results
1	A;20/F	YES	10 months	None	Reduced Wheezing and Medication
2	B;29/M	YES	Still practicing since one year	None	Inhaler use ceased, improved BMI and work performance
3	C;76/F	YES	Still practicing since two years	None	Medication dosage reduced to minimum
4	D;59/M	YES	Practised for one year. Now practice is based on symptoms	None	After practise, breathing becomes easier
5	E;37/M	YES	9 months	None	Symptom-free; less medication

**Table 2:** Further Comments of Subjects.

The zero drop-out rate observed for participants in the present study means that the significant clinical improvements are not reduced in that way. It indicates that subjects found the procedure entirely acceptable. Indeed, several of them wrote appreciative notes saying how pleased they were, particularly to be able to continue treatment even when travelling away from home.

The loss of interest usually observed in patients given a 60-minute yoga module for daily practice over a long period of time was not seen. Instead, patients showed enthusiasm, as described above. The new protocol could be completed in 20 to 30 minutes. All the breathing practices could be done simply standing up or / sitting in a comfortable chair.

Floor space to stand upright, and chairs to sit on are always available. Space to do relaxation lying down can always be found. We suggest that the new module may be feasibly practiced by asthmatics with other comorbidities, though evaluating that will require further research.

**Strengths**

The shortness of the protocol, and its ease of practice, are clearly strengths of study design. The zero dropout rate and acknowledged

enthusiasm of participants constitute the chief strengths of the results.

**Weakness**

This study only included a limited number of participants; clearly its repetition on a much larger group will add weight to its results; also, a wider age group. Several other yoga kriya practices that might also improve efficacy were not included in the protocol, e.g. dhauti.

Outlook for Future Research: in addition to remedying the above weakness, certain changes in the neurophysiology, immunology and biochemistry could be assessed, in order to develop a fuller picture of the clinical benefits and the mechanisms behind them. This would provide the protocol greater authenticity.

Sl. No	Severity	Age	Gender	Acceptance
1	Moderate	20	F	Yes
2	Mild	22	M	Yes
3	Moderate	25	F	Yes
4	Mild	24	M	Yes
5	Mild	26	M	Yes

**Table 3:** Second Five Subjects with PF Teste.

Sl. No.	Name	Did they like	Did long did they practice at home	Any difficulty	Others
1	A;20/F	YES	10 months	Nil	Enjoyed doing Yoga
2	B;22/M	YES	5 months continuous. Now only when symptoms appear	Nil	20-30 minutes practice is an easy job. Breath has become easier.
3	C;25/F	YES	8 months	Nil	Could easily practise when away from home.
4	D;24/M	YES	Still practicing since one year	Nil	Easy to practise anywhere
5	E;26/M	YES	Still practicing since one year	Nil	It has become part of daily schedule.

**Table 4**

**Conclusion**

The study demonstrates the possibility of designing shorter yoga modules lasting 20-30 minutes that produce good clinical results. Careful selection of practices can lead to an efficacious yoga module practical for all ages, even for those with stiffness and overweight. Dropouts can become a thing of the past.

**Conflict of Interest**

The authors have no Conflict of Interest to declare.

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