ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Impact of Short Term Practice ofShavasana on Pulmonary Function in Bronchial Asthma

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ABSTRACT

Asthma is a clinical syndrome of unknown etiology characterized by recurrent episodes of airway obstruction that resolve spontaneously or as a result of treatment. It is one of the common psychosomatic illnesses influenced by many factors. Yoga has been used to treat asthmatic patients in India for over fifty years. Several studies have shown significant improvement in pulmonary functions in asthmatics following practice of yoga which included multiple asanas. Hence there is a need to evaluate the effect of single asana for short-term duration on pulmonary functions. Therefore the present study was undertaken to know the effect of shavasana on selective pulmonary function tests (PFT) in asthmatics.Thirty male, uncomplicated asthmatic patients with disease duration of 2-5years and the mean age of 28.73years were compared for PFT with thirty healthy male with mean age of 27.17years.The PFT was repeated in asthamaticsafter they underwent for shavasana training twice a day for three weeks. The results were analyzed by students unpaired and paired't' test. PFT values were significantly reduced in asthmatics compared to controls. Shavasana training has not improved these values significantly. This may suggest that the practice of shavasana does have an effect on pulmonary function but fails to make a satisfactory impact when practiced as a single asana for short duration.

Key Words: Bronchial asthma; Shavasana; Pulmonary function tests, Yoga

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ISSN: 0975-8585

INTRODUCTION

The term 'asthma' encompasses several distinct disease phenotypes leading to differences in diagnostic classification. The most widely accepted definition is 'a chronic inflammatory disorder of the airwaysusually associated with widespread but variable airflow obstruction and an increase in airway response to a variety of stimuli' [1]. Bronchial asthma is not a specific disease, but a syndrome that derives multiple precipitating mechanisms resulting in airway hyper responsiveness and airway obstruction. It is a functional disorder and has a psychosomatic basis and bronchodilators give symptomatic relief. The morbidity and mortality from asthma appears to be increasing. And it has been suggested that medications used to treat asthma are contributing to this trend [2].

The failure of conventional medicine to provide complete cure of psychosomatic ailment has prompted researchers to consider alternative methods of treatment [3]. Yoga has been used to treat patients with asthma for over 50 years in yoga centres in India. Goyeche et al and several other workers have shown convincing evidence of the beneficial effects of yoga in patients with bronchial asthma [4]. The word yoga is derived from a Sanskrit word "Yug" which means union of mind, body and spirit. Linkage between mind and body has now been scientifically established. Yoga is an auxiliary means which acts synergistically with the conventional medicine. The yogic postures improve vital organ functioning by influencing the mind without giving fatigue to muscles. Yoga and relaxation techniques keep the body fit and strong plus gives a feeling of well being. It improves respiratory functions and has a positive effect on respiratory diseases like asthama [5]. Measurement of ventilatory functions is a well established part of pulmonary medicine and lung function parameters are used in the diagnosis of respiratory diseases, assessment of clinical status and drug treatment response, as well as in the surveillance of patients with a chronic pulmonary disease [6].

Yoga includes meditation, relaxation, control of breathing, and various physical postures (asanas). Regular practice of yoga establishes natural harmony and functional balance between various organ systems, leading to better health and a feeling of well-being [7]. It is well documented that the practice of a set of yogasanas even for a short period as 2-3 weeks has improved pulmonary functions in asthmatics [2, 4, 8, 9]. Hence there is a need to examine the value of a single asana of short-term duration in influencing pulmonary functions. Shavasana is one such asanas in which body and mind are completely relaxed. So the present study is an attempt to evaluate the effect of short term practice of shavasana on pulmonary functions in asthmatics.

MATERIALS AND METHOD

The present study was conducted in the department of physiology, Karnataka Institute of Medical Sciences, Hubli, after obtaining the approval from Institutional ethics committee.
Thirty adult males in an age group of 20 to 40 years leading a sedentary life style with a history and clinical features of bronchial asthma as per American thoracic society [10] for past 2-5 years with at least two acute asthmatic exacerbations in any year were considered as study

group. And thirty age and physical activity matched healthy male individuals were considered as control group.

Asthmatics in acute exacerbation, smokers, individuals with history of upper or lower respiratory tract infections in the past 3 weeks, present or past history of cardiac disease, diabetes mellitus, endocrine disorders, tuberculosis, central or peripheral nervous system disease and also those who have received any drug modulating the pulmonary or autonomic nervous system for the preceding two weeks of test were excluded from the study.

Written informed consent was taken from each participant about the detailed procedure and purpose of the study was explained to them. The medications were stopped 48hours before recordings were taken. They were allowed to take only bronchodilators whenever necessary.

The recordings were done usually between 10.00 am to 1.00 pm. All the techniques of measurement, duration, instruments were maintained uniformly throughout the study. The participants were made to relax and be comfortable prior to the tests.

Standing height was measured up till last 0.1cms without foot wear, with the subjects back to a wall and with both heels placed together and touching the base of the wall. Weight was recorded without foot wear, and with empty pockets. The study group and controls were briefed about the procedures of selective pulmonary function measurements.

Pulmonary Function Testing

The instrument used in this study was Spirolysor SPL-95 manufactured by France International Medical (FIM), Lyon. It has a pneumotachograph with a sensor that detects air flow; volume is obtained by digital integration of the flow signal. A black cone is attached to the sensor, to which disposable card board mouthpieces can be attached. The sensor is connected to the instrument via, two pressure tubes. The instrument was calibrated with a three liters syringe before starting the procedure. The subjects were made to sit comfortably and relaxed in a chair. The procedure was explained and demonstrated. The subjects were allowed to get accustomed to the instrument and also practiced the maneuvers. They were asked to perform the forced vital capacity (FVC) and Maximum voluntary ventilation (MVV) maneuvers and the following parameters were assessed in both the control and study groups – FVC, forced expiratory volume in 1second (FEV_1), FEV_1/ FVC, and MVV. The best of the three performances were considered.

Practice of Shavasana

The study group were trained in shavasana by a yoga expert in a well ventilated room every day morning (7.00 -8.00 am) and evening (6.00-7.00 pm). Shavasana means being motionless and fixed, but witha relaxed posture akinto a dead body. The very aim of this asana is to relax each and every muscle in the body. In order to reach or attain this aim it becomes

ISSN: 0975-8585

necessary to take the position in which one finds all the organs of the body in a comfortable and soothing state. Breathing must be slowed down.

The shavasana procedure was explained and demonstrated by a yogic teacher. Afterwards they were asked to practice this asana for 3 days under supervision. Then they were allowed to undergo shavasana training, both morning and in the evening for 20-30 minutes. After three weeks of shavasana practicing, the selective pulmonary parameters were again measured in study group.

Statistical Analysis

The results obtained in both the study and control groups were expressed as mean $\pm$ standard deviation. Student`s unpaired 't'- test was done to compare the mean values of two groups. And a paired 't'- test was used to anlyse the change in mean values of study group after practicing the shavasana. A p value of <0.05 was considered as statistically significant.

RESULTS

In the present study thirty asthmatic male individuals aged about 28.73 ± 3.82 years, with a mean height of 165.1± 5.02 centimeters and weighing 61.63 ± 8.43kilograms were considered as study group and thirty males aged 27.17± 2.94 years with a mean height and weight of 167.86±5.36 centimeters and 61.97 ± 4.84kilograms respectively were considered as controls.On comparison of the above mentioned anthropometric parameters no statistically significant difference was observed between the two groups.

TABLE 1: Showing the PFT results in controls and study group.

Parameters	Controls(C) n=30	Study group (S1) n=30	'p' value	Significance
Forced vital capacity (in Lit.)	3.02± 0.48	1.96± 0.50	<0.001	HS
Forced expiratory volume in 1 sec.(Lit/sec)	2.85± 0.43	1.28± 0.46	<0.001	HS
FEV_1 /FVC Ratio	0.85± 0.07	0.59±0.15	<0.001	HS
MVV (in Lit./min)	112.90±21.3	42.0±15.7	<0.001	HS

HS: Highly Significant

TABLE 2: Showing the PFT results in Asthamatics before and after shavasana

Parameters	Subjects [n=30]	Subjects [n=30]	P value	Significance
Forced vital capacity (in Lit.)	1.96± 0.50	1.96± 0.46	>0.05	NS
FEV in1 sec (Lit/sec)	1.28± 1.31	1.31± 0.42	>0.05	NS
FEV_1 /VC Ratio	0.59± 0.15	0.61±0.13	>0.05	NS
MVV (in Lit./min)	42.02±15.72	42.94±16.22	>0.05	NS

NS: Not Significant

On analysis of mean values of respiratory parameters, a highly significant reduction in the mean values of study group was observed when compared with the mean values of controls as shown in the table 1.

The mean values of pulmonary function parameters were improved in asthmatics as a slight increase in these values were observed after a three week practice session of the shavasanaas shown in the table 2. However this improvement reveled to be statistically insignificant.

DISCUSSION

Abundant objective data now exist indicating that psychological factors can interact with the asthmatic diathesis to worsen or improve the course of the disease. The mechanisms of these interactions are complex and not well understood, but psychological factors may affect about half of all patients. Modification of vagal efferent activity seems to affect the calibre of airways.

Goyeche et al claimed that the psychosomatic imbalance is present in many, if not all patients with asthma. Suppressed emotion, anxiety, dependence, and extreme self consciousness may all be accompanied by generalized and localized muscle tension, including that of the voluntary respiratory musculature. This increased muscle tension may be a precipitating or concomitant factor that perpetuates and aggravates the asthmatic syndrome [4]. Yoga and relaxation techniques are becoming more and more popular among the people of the world, and could form the basis of prevention and cure of many chronic psychosomatic problems. The specific postures recommended for asthma are the following [7]:

1. Sarvangasana—shoulder stand, which achieves the head-low posture for increasing the range of diaphragmatic movement and for pulmonary drainage
2. Shavasana—which achieves total body relaxation
3. Dhanurasana
4. Matyasana

Many studies were available suggesting the beneficial effect of yoga practice in asthma. But results in all these studies were based on practice of various yogasanas or pranayama or a combination of both. Shavasana as a relaxation technique gives the nervous system a chance to take a brief pause before it is forced once again to deal with all the usual stresses of daily life. So the present study aimed to evaluate the effect of shavasana as a relaxation technique on pulmonary functions in adult asthmatic male individuals with disease duration of two to five years.

Both the asthmatic and control group were well matched in this study by means of anthropometric measurements but a highly significant drop in respiratory function parameters such as FVC, FEV_1, FEV_1/ FVC ratio in asthmatics in comparison with controls was observed. This was similar to the findings of Gupta S et al [11], PrabhathK.D.shah et al [12], and Manoj Kumar et al[13].The airway caliber of lungs involves various airway functions like smooth muscle tone,

epithelial cell function, mucous secretion, blood flow, micro vascular permeability and inflammatory mediator release under normal circumstances, which are all controlled by the autonomic nervoussystem. This system comprises different types of afferent and efferent pathways mediated through cholinergic, adrenergic and non-adrenergic non-cholinergicmechanisms which may be excitatory (bronchoconstrictor) or inhibitory (bronchodilator). Bronchial obstruction in asthma occurs due to impaired function of the prejunctional auto inhibitory M 2 –cholinoceptor that causes an increased and uncontrolled release of acetylcholine. In addition to this, damage in the airway epithelium which occurs in asthma causes exposure of afferent endings leading to increased sensitivity to the inhaled irritant as well as to enhance mediator release under baseline conditions [13]. This can explain the reduced pulmonary functions in asthmatics.

After practicing shavasana for three weeks asthmatics showed a slight improvement in pulmonary function tests but that was statistically insignificant and this finding is in concordance with the findings of Khanam A A et al [14], whereas in the study conducted by Nagarathna et al [4],T N Sathyaprabha et al [2], and Vempati et al [8], a significant improvement was observed in pulmonary functions after yoga practice. However the duration of yoga practice in these studies ranged from two to eight weeks, and included a combination of yogasanas, suryanamaskar and pranayamayas. Whereas asthmatics in the study of Sathyaprabha et al [2], also underwent dietary intervention and naturopathy treatment which was not followed in the current study. The results observed in these studies indicate that the yoga reduces stress and also decreases vagal out flow to the lungs which can cause bronchodilatation and a small decrease in bronchial reactivity [15]. However the finding in present study noticed an improvement in pulmonary function values following shavasana practice though it was not significant. This may suggest that the practice of shavasana does have a salutary effect on pulmonary function but which fails to make a satisfactory impact when practiced as a single asana and for short duration.

CONCLUSION

In the present study pulmonary function test values show a significant difference between asthmatics and controls. This is due to enhanced parasympathetic activity in respiratory system of asthmatics. After practicing shavasana for three weeks these pulmonary function test values showed improvement in asthmatics but these were not statistically significant. So shavasana when practiced as a single asana has not brought any significant improvement in asthmatics. Therefore a combination of many asanas would be more useful. Moreover the subjects in the current study were exposed to the shavasana training for the first time in their life, hence practicing of shavasana regularly for longer duration may improve the beneficial results. Scarcity of literature regarding effect of long term practice of shavasana on pulmonary functions, necessitates the requirement of further work in this field.

ISSN: 0975-8585

REFERENCES

[1] Lewis MJ, Shorta AL, Lewis KE. Respiratory Medicine 2006 ;100:1688–1705.

[2] Sathyaprabha TN, Hemalatha M, Murthy BT C. Indian J Physiol Pharmacol 2001; 45(1):80-86.

[3] NagarathnaR, Nagendra H R, Seethalakshmi R. The Indian Practitioner 1991; 44(7):491-493.

[4] Nagarathna R, Nagendra H R. British Med J 1985; 29(19):1077-1079.

[5] Sangeeta Jain, MeetaJain,C. S. Sharma Indian J Physiol Pharmacol 2010; 54(2):183-185.

[6] NystadW,Samuelsen S O, Nafstad P, Edvardsen E, Stensurd, Jaakala JJK. Thorax 2002; 57:1021-1027.

[7] Nirmala N. Nayak, Kamala Shankar.Phys Med RehabilClin N Am 2004;15: 783–798.

[8] Vempati R , Bijlani RL, Deepak KK. BMC Pulm Med 2009; 30:9-37

[9] Candy Sodhi, Sheena Singh, P. K. Dandona. Indian J Physiol Pharmacol 2009; 53 (2) : 169–174

[10] American Thoracic Society, Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease (COPD) and asthma. Am Rev Respir Dis 1987; 136:225-244.

[11] Gupta S, DolwaniS. Indian J Chest Dis Allied Sci 1996; 38(3):147-56.

[12] Shah P K, Lakhotia M, Mehta S, Jain S K, Gupta G L. Chest 1990; 98:1408-1413.

[13] Manojkumar, Verma NS, Tiwari S, Pandey US. Indian J Physiol Pharmacol 2005; 49(1):89-94.

[14] Khanam AA, Usha S, Guleria R, Deepak KK. Ind JPhysiolpharmacol1996; 40(4):318-324.

[15] Manocha R, Marks GB, Kenchington P, Peters D, Salome CM. Thorax 2002; 57:110-115.