IMCR
CASE REPORT

Immediate effect of yogic chair breathing in diagnosed copd patient due to smoking addiction: a case report

Anusha R.[1]* and Reshma P. Jogdand[2]

[1]The School of Yoga and Naturopathic Medicine, SVYASA University, Bangalore, India
[2]Department of Life sciences, SVYASA University, Bangalore, India

KEY WORDS

COPD
Yogic chair breathing
Lung capacity

**Corresponding Author:*

Anusha R.
The School of Yoga and
Naturopathic Medicine,
SVYASA University, Bangalore, India
Contact no: +91-8296276847
E-mail: anushaarkumar@gmail.com

ABSTRACT

A 54 years old male patient with K/C/O-COPD, was diagnosed in August 2015 and receiving LAMA (Long-acting muscarinic antagonists) in the last 6 years. The patient had a history of smoking in the past 25 years. In 2015, an X-ray showed hyperinflated in the lungs, a CT scan showed enlargement of the left pulmonary artery, and a pulmonary Function test, FEV1 = 48%. In March 2022 participant came to the hospital in Bangalore with complaints of shortness of breath, breathlessness, coughing, and insomnia. Then he was advised to practice yogic chair breathing for 45 minutes. There was a significant improvement in relieving symptoms like shortness of breath and breathlessness. The present case study is to assess the effect of chair breathing (YCB).

doi: 10.38205/imcr.030254

Introduction

Global initiative for obstructive lung disease (GOLD) has described persistent obstructive pulmonary disease (COPD) as a not unusual preventable and treatable ailment characterized with the aid of revolutionary airflow obstruction thereby causing overextension of the lung leading to lack of elastic drawback and air trapping. These physiological adjustments are related to an altered sample of ventilator muscle recruitment. The musculature of the rib cage makes an increased contribution to chest wall motion with growing in the accessory muscles for ventilation. COPD is a grave public health problem that poses a primary motive for morbidity and mortality worldwide. According to a report with the aid of the worldwide burden of ailment, COPD might be the fifth main reason for disability and the 0.33 leading motive of death in the first half of the twenty-first century. It is anticipated that by 2020, COPD may be the 0.33 fundamental cause of death international and could have 5th rank in phrases of social burden (1).

The common distressing and disabling symptoms of those who be afflicted by COPD encompass shortness of breath and dyspnea. Dyspnea is a usual symptom often experienced by advanced COPD patients (90%–95%). Current pharmacotherapy of COPD relies mainly on anti-inflammatory markers and bronchodilators that are of limited efficacy for the comfort of dyspnea and are regularly followed with troublesome damaging outcomes. Further, drug insensitivity or refractory instances of COPD are surfacing hastily. Therefore, exploring adjuncts from opportunity forms of therapy is exceptionally wished for better management of COPD patients. The Government of India encourages the practice of traditional medicines as it performs a vital position in imparting fitness care to a big section of the population effortlessly and at low value. Besides, the cutting-edge method is being used for validation of such useful outcomes of opportunity medicines from the traditional system (2).

Yoga is an ancient science of existence that originated in India and has emerged as an alternative shape of therapy and is being mentioned globally. The most important concept of yoga is to connect or unite mind, body, and spirit which helps the practitioner to bring maximum power and efficacy. The practice of yoga is well-known and shows an effective and profound effect on the respiration gadget. It eliminates anxiety thereby inducing a relaxing effect on the brain. The best respiration advantage may additionally come from the everyday exercise of pranayama (controlling the breath) and yoga asana (body postures) which match at once on both mind and breathing devices. Regular yoga exercise may also strengthen lung muscle groups, widen airways and provide relief from dyspnea (1).

It has been reported that after patients with COPD have been non-particularly trained via yogic physical activities, the strength of both the inspiratory and expiratory muscle groups multiplied with beneficial results on exercise performance and quality of existence. Several medical trials have proposed that yoga education may additionally improve the pulmonary characteristic of patients with COPD, but only a few scientific types of research are to be had to evaluate the respiration vitals like PEFR, SpO_2, RR, and Brahmari time. Therefore, the look became designed to evaluate the effects of yogic chair breathing intervention in COPD patients (2).

Pathophysiology

Airflow is always not fully reversible in COPD. Remodeling of the small-airway compartment and lack of elastic recoil through emphysematous destruction of parenchyma results in the revolutionary decline of FEV1, insufficient lung emptying on expiration, and next static and dynamic hyperinflation. To a pathological level, exposure to smoke results in the infiltration of the mucosa, submucosa, and glandular tissue with the aid of inflammatory cells. Increased mucus content material, epithelial-cell hyperplasia, and disturbed tissue restoration with wall thickening within the small airways are cardinal features of COPD (Table 1). This revolutionary narrowing, obliteration, and even elimination of the terminal bronchioles are followed by emphysema, which generally starts evolving within the respiration bronchioles. The components that outcome in the thickening of the small airways route and obliteration of lung tissue may likely be multifactorial pathobiological processes that may be communicating with the history of hereditary determinants, lung development, and environmental stimuli. Within this system, we, talk about the pathogenesis of COPD as a progressive immunological disorder (Figures 1–3) (4).

Case presentation

A 54 years old male 'Mr. YYY from Bangalore had K/C/O COPD for the last 6 years. He was smoking from the year 1987 and quieted in the year 2015. He had a history of smoking for 25 years (2packets of cigarettes per day). In the year 2014, he developed chest pain, chest tightness, heaviness in the chest, and shortness of breath while doing daily activities and rest.

Table 1: Risk factors for the development of chronic obstructive pulmonary disease (3)

Environmental factors
• Tobacco smoke: accounts for 95% of cases • Indoor air pollution: cooking with biomass fuels in confined areas in developing countries • Occupational exposures, such as coal dust, silica, and cadmium • Low birth weight: might reduce maximally attained lung function in young adult life • Lung growth: childhood infections or maternal smoking may affect the growth of lungs during childhood, resulting in a lower maximally attained lung function in young adult life • Infections: recurrent infection may accelerate the decline in FEV1; persistence of adenovirus in lung tissue may alter the local inflammatory response, predisposing to lung damage; HIV infection is associated with emphysema • Low socioeconomic status • Cannabis smoking
Host factors
• Genetic factors: alpha1-antitrypsin deficiency; other COPD susceptibility genes are likely to be identified • Airway hyper-reactivity

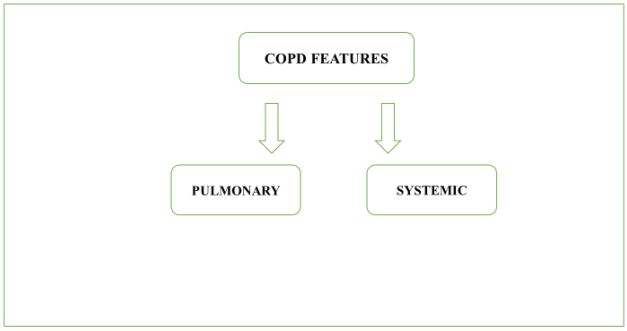


Figure 1: The features of pulmonary and systemic in COPD (3)

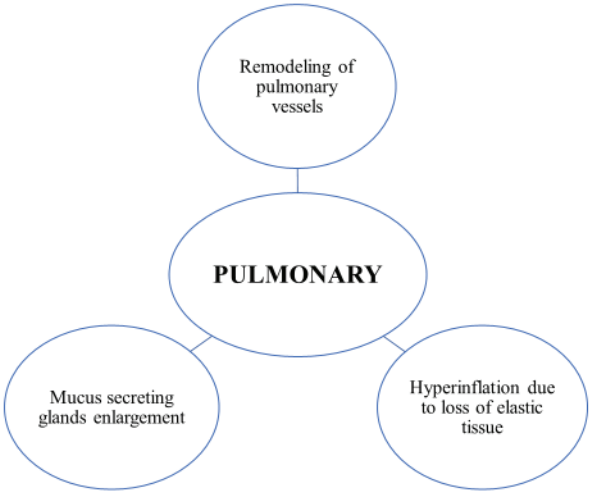


Figure 2: Pulmonary features in COPD (3)

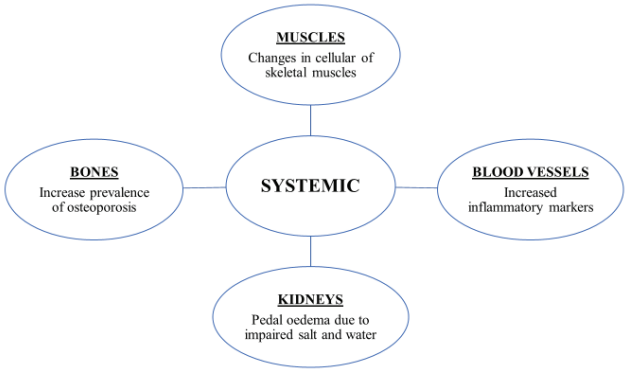


Figure 3: Systemic features in COPD (3)

In the year 2015, he went to the hospital for a check-up and the doctor advised him to x-ray and CT scan and diagnose him with COPD. An X-ray showed hyperinflated in the lungs, a CT scan showed enlargement of the left pulmonary artery. He was under medication LAMA (Long-acting muscarinic antagonist) for the last 6 years.

He came to the hospital in southern India, Karnataka (Bangalore) on 13 march 2022 for a regular check-up with symptoms of shortness of breath, breathlessness, coughing, and insomnia. Then he was advised to practice a single session of yogic chair breathing for 45 minutes where pre and post-data of respiratory vitals were taken (PEFR, SpO_2, Brahmari time, RR).

1. Peak Expiratory Flow Rate (PEFR)

The wright top expiratory flow meter became added in 1959 and provided a portable piece of the device for assessing some elements of lung features inside the ambulatory care setting. Peak expiratory glide (PEF) can be safely used that can assess the severity of COPD a well-known tool. PEFR reflects quite some physiological traits of the lungs, airlines, and neuromuscular traits of people. These include lung elastic balk, massive airway caliber, lung extent, effort, and neuromuscular integrity (5,6).

2. Partial pressure of Oxygen (SpO_2)

Pulse oximetry is a non-invasive technique affording a speedy measurement of oxygenation of hemoglobin in the peripheral capillary. Pre-Post peripheral capillary SpO_2% has been assessed for each participant with the use of a portable pulse-oximetry device (Nonin 9570 mild emitting diode pulse oximeter, USA). The percentage of peripheral capillary SpO_2% was measured after connecting the optical diodes on the sufferers' fingers by way of transcutaneous pulse oximetry (7).

3. Brahmari

Brahmari pranayama (humming bee breath) is one of the yogic practices, which entails sitting in sukhasana the concern must inhale via each nostril and whilst exhaling produce the sound of a female humming bee (8).

4. Respiratory Rate (RR)

A respiratory charge is an essential sign that is associated with, consequently regulated by way of, physiological and neural sports. RR performs an essential function in the detection of numerous cardiovascular and respiratory diseases, as well as scientific activities. RR over 25 cpm is considered one of the COPD exacerbation symptoms while the ordinary variety of RR in adults is about 12–20 cpm. RR goals consist of an evaluation of the sensitivity and specificity of respiratory rate monitoring outcomes to expect COPD worsening requiring clinical intervention (9,10).

Protocol

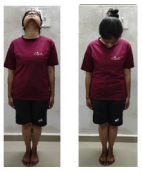
A single session of YCB (Yogic Chair Breathing) for 45 minutes (Table 2 & Figure 4) (11).

Table 2: Protocol steps of Yogic chair breathing (YCB)

Steps	Methods	Figures
1	**Relaxation using a chair as an arm** a) Sit on the carpet with legs stretched. Pull the chair towards the chest with head and arms collapsed on the seat of the chair. b) Tense the entire body from toes to head and relax. c) Regional relaxation from toes to head.	
2	**Neck muscle relaxation with chair support** a) Move neck backward and forward slowly to relax the posterior neck muscles – 5 times. b) Inhale as deeply and slowly as possible while bending the neck backward, exhale while forward bending – 5 times. c) Chant 'AA' while bending the neck forward – 5 times.	
3	**Neck movements in Vajrasana** a) Move the forward and backward as before, remove the chair and sit in Vajrasana – 5 times. b) Inhale while going back, exhale while bending forward – 5 times. c) Chant 'AAA' while bending the neck forward – 5 times.	
4	**Sasankasana** a) Bend backward and forward from the waist while in Vajrasana – 5 times. b) Synchronize the breathing with this movement – 5 times. c) Chant 'MMM' while bending forward – 5 times.	
5	**Tadasana** (about one minute): Relax from toes to head while standing in Tadasana.	

(*Continued*)

Table 2: (*Continued*)

Steps	Methods	Figures
6	**Neck movements in Tadasana** a) Forward and backward – 5 times. b) With breathing – 5 times. c) With breathing and Bhramari – 5 times.	
7	**Ardha Chakrasana – Pada Hastasana** a) Bend forward from Tadasana to Pada Hastasana slowly and raise to Tadasana and bend backward to Ardha Chakrasana return to Tadasana – 5 times. b) Tadasana – Pada Hastasana – Tadasana – Ardha Chakrasana – Tadasana series with breathing – 5 times. c) Movement, breathing, and Bhramari – 5 times.	
8	**Savasana** a) Feel the natural abdominal movements building up. b) With breathing 5 times. c) Movement, breathing, and 'AA' sound.	

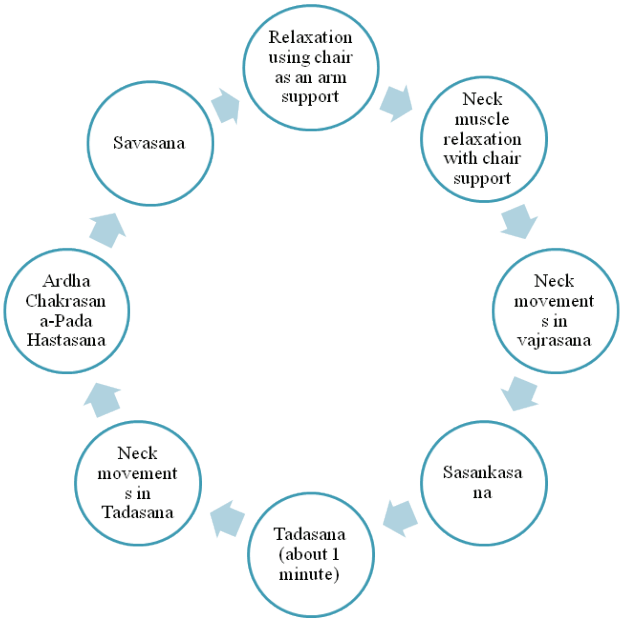


Figure 4: Steps of Yogic chair breathing (YCB) (11)

The graphical presentation suggests that there may be a marked effective reduction in symptoms rating and good improvements in all variables such as PEFR pre (280 L/min) and post (340 L/min), SpO_2 pre (89%) and post (95%), RR pre (24 CPM) and post (20 CPM), Brahmari time pre (9 sec) and post (13 sec) after the practice of yogic chair breathing (YCB). Positive improvements in all respiration crucial signs and symptoms. Respiratory rate shows a high-quality development (Table 3 & Figure 5).

Table 3: Vital data in the numerical form before and after yogic chair breathing

Variables	Pre – data	Post – data	Percentage %
PEFR (liters/minute)	280	340	–21.42
SPO_2 (%)	89	95	–6.74
RR (Cycles/minute)	24	20	16.66
BRAHMARI TIME (Seconds)	9	13	–44.44

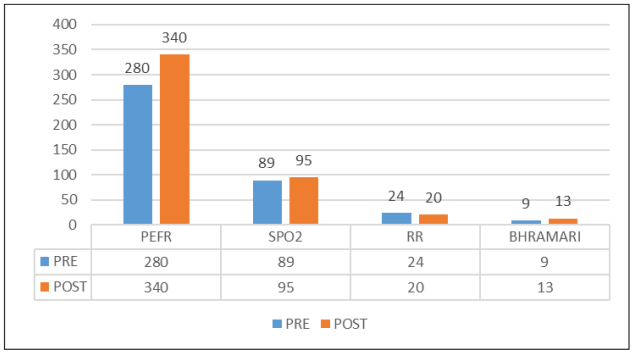


Figure 5: Graphical representation of Peak expiratory flow rate, Oxygen saturation, Respiratory rate, and Brahmari before and after yogic chair breathing

Discussion

COPD is a progressive and weakening disease that's one of the main reasons for morbidity and mortality internationally mainly in India. As the ailment progresses, impairment of lung characteristics decreases the physical inaction of the patient. One of the motives for COPD being a debilitating condition is the state of being inactive leading to a similar deterioration of the ailment via weakening muscles.

Hence, in this state of affairs yogic chair breathing (YCB) practice can help to improve the great of life and lung function. This is because with proper breathing extra oxygen is to be had for the trade at the tissue level. And continuous stretching postures relieve Broncho-constriction, increase respiration stamina, relaxation of the chest muscle groups, expand of lungs, raise the energy stage, and calm the mind.

Yogic Chair Breathing (YCB) helps to work in the condition of a closed airway. It helps to promote Abdominal respiration which relieves the diaphragm and helps to improve respiration. It also clears the airways which increases the

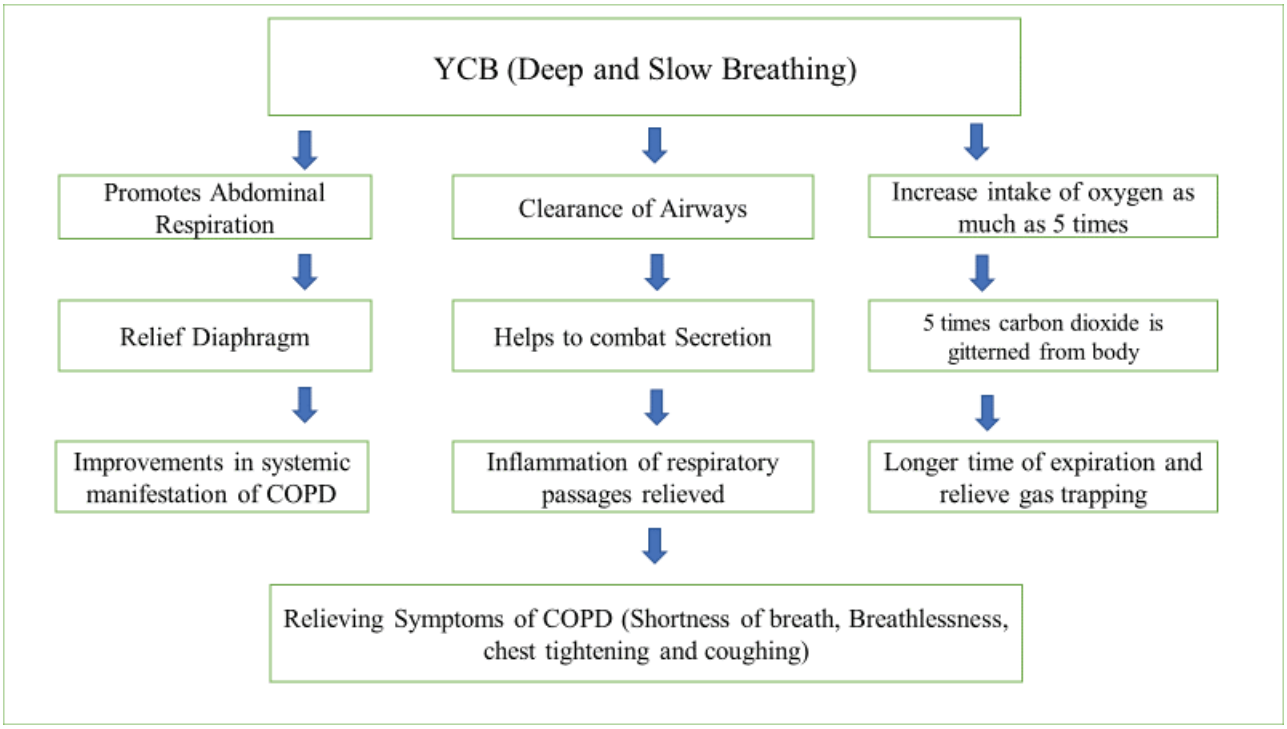


Figure 6: Changes in the respiratory system after the practice of yogic chair breathing

intake of oxygen as much as 5 times and releases carbon dioxide as much as 5 times leading to a longer time of respiration (Figure 6).

In this study, all variables such as PEFR pre (280 L/min) and post (340 L/min), SpO_2 pre (89%) and post (95%), RR pre (24 CPM) and post (20 CPM), Brahmari time pre (9 sec) and post (13 sec) before and after the practice of yogic chair breathing. It shows that there are positive improvements in all respiratory variables such as Peak expiratory flow rate (–21.42%), Oxygen saturation (–6.74%), Respiratory rate (16.66%), and Brahmari time (–44.44%). Respiratory rate shows a high-quality development.

Conclusion

Yogic chair breathing is effective in improving respiratory vitals such as Peak expiratory flow rate, Oxygen saturation, Respiratory rate, and Brahmari time in COPD patients.

Acknowledgement

First of all, I express my gratitude to my parents, instructors, and friends for their blessing and cooperation. Special thanks to Dr. Reshma P Jogdand who inspired me for the study, her steering and assistance made me stronger and more assured to have a look at this study.

Authors' contribution

AR: Analyses and writing
RPJ: Review and editing

Informed consent form

Yes.

Source of funding

Nil.

Conflict of interest

Nil.

Received Date: 09-05-22; Revised Date: 26-07-22
Accepted Date: 30-07-22

References

1. Thokchom SK, Gulati K, Ray A, Menon BK, Rajkumar. Effects of yogic intervention on pulmonary functions and health status in patients of COPD and the possible mechanisms. Complementary Therapies in Clinical Practices. 2018 Nov 1;33:20–6.
2. Thokchom SK, Gulati K, Ray A, Menon BK, Rajkumar. Effects of yogic intervention on pulmonary functions and health status in patients of COPD and the possible mechanisms. Complementary Therapies in Clinical Practices. 2018 Nov 1;33:20–6.
3. Davidson's Principles and Practice of Medicine 21st Ed.pdf.
4. Vogelmeier CF, Criner GJ, Martinez FJ, Anzueto A, Barnes PJ, Bourbeau J, et al. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Lung Disease 2017 Report. GOLD Executive Summary. American Journal of Respiratory and Critical Care Medicine. 2017 Mar 1;195(5):557–82.
5. Lebowitz MD. The use of peak expiratory flow rate measurements in respiratory disease. Pediatric Pulmonology. 1991;11(2):166–74.

6. Cen J, Ma H, Chen Z, Weng L, Deng Z. Monitoring peak expiratory flow could predict COPD exacerbations: A prospective observational study. Respiratory Medicine. 2019 Mar 1;148:43–8.
7. Ranjita R, Hankey A, Nagendra HR, Mohanty S. Yoga-based pulmonary rehabilitation for the management of dyspnea in coal miners with chronic obstructive pulmonary disease: A randomized controlled trial. Journal of Ayurveda and Integrative Medicine. 2016 Jul 1;7(3): 158–66.
8. Mooventhan A, Khode V. Effect of Bhramari pranayama and OM chanting on pulmonary function in healthy individuals: A prospective randomized control trial. International Journal of Yoga. 2014;7(2):104.
9. Al-Halhouli A, Al-Ghussain L, Khallouf O, Rabadi A, Alawadi J, Liu H, et al. Clinical Evaluation of Respiratory Rate Measurements on COPD (Male) Patients Using Wearable Inkjet-Printed Sensor. Sensors (Basel). 2021 Jan 2;21(2):1–19.
10. Kim KS, Byun MK, Lee WH, Cynn HS, Kwon OY, Yi CH. Effects of breathing maneuver and sitting posture on muscle activity in inspiratory accessory muscles in patients with chronic obstructive pulmonary disease. Multidisciplinary Respiratory Medicine. 2012 Jun 20;7(1):9.
11. Nagarathna R, Nagendra HR, Seethalakshmi R. Yoga – chair breathing for acute episodes of bronchial asthma. Vol. 9, Lung India. 1991. pp. 141–4.