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Complementary Therapies for Chronic Obstructive Pulmonary Disease

Reel JJ*, Campbell H, Kerr JG and Sinclair SM

College of Health & Human Services, University of North Carolina Wilmington, USA

***Corresponding author:** Justine J. Reel, College of Health & Human Services, University of North Carolina Wilmington, USA, E-mail: reelj@uncw.edu

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Overview

An estimated 26.8 million individuals in the United States suffer with Chronic Obstructive Pulmonary disease (COPD) and nearly half of Americans with COPD (i.e., 12 million) go undiagnosed and untreated [1]. The overwhelming majority (94%) of COPD cases are attributed to smoking [2]; however, environmental and occupational exposures (e.g., dust, fuels, and other irritants), asthma, and tuberculosis may also increase COPD risk [3]. COPD represents the third leading cause of death in the United States and worldwide [4]. The World Health Organization predicts COPD will become the leading cause of death world-wide by 2050. COPD, which represents a major public health threat, carries a significant cost burden associated with hospitalizations and healthcare, impaired daily functioning, disability, mental health issues such as depression and anxiety, and challenges for caregivers [5]. Current treatment recommendations focus on prevention (smoking cessation) and palliative measures (pharmacotherapy, pulmonary rehabilitation), and surgery [6]. Despite the severity and costs, these traditional therapies have been inadequate for consistently slowing the procession of the disease or improving the patient's quality of life. In addition, medications may be associated with negative side effects [7]. This paper will critique traditional therapies and argue for expansion of complementary therapies.

Limitations of Existing Therapies

While prescription medications have not been shown conclusively to modify the long-term decline in lung function [6], they are an important aspect of COPD management. Medications, such as bronchodilators and corticosteroids taken orally or by inhalation, are used to minimize COPD exacerbations, manage symptoms, improve health status and increase exercise tolerance. Annual vaccinations against influenza, whooping cough, and other diseases are recommended to prevent infections that could lead to serious complications in people with COPD (CDC, 2015). However, a variety of side effects are associated with COPD medications, including dry mouth, headache, tremor, increased heart rate, and nausea, among others [8]. Serious side effects include an increased risk for fatal and non-fatal cardiovascular events [9], cardiac arrhythmias [10], and pneumonia [11]. The existence of an association between long-acting bronchodilators and cardiovascular events is currently an area of debate [12].

People with severe COPD, who no longer respond to pharmacotherapy, may be otherwise healthy enough to tolerate surgery. Adverse outcomes associated with general anesthesia, particularly cardiovascular instability [13] and post-operative pulmonary complications, limit this option for many people with COPD. When surgery is feasible, one of the following three procedures is used: bullectomy, lung volume reduction surgery (LVRS), and lung transplantation. Both bullectomy and LVRS involve removal of damaged tissue, which allows the remaining lung tissue to function more effectively. Bullectomy is the removal of one or more large bullae (air sacs created from damaged alveoli) that interfere with breathing. In LVRS, damaged tissue is removed resulting in about a 20% to 30% reduction of the total lung volume. Lung transplantation involves the removal of one or both damaged lungs and replacement with donor organs, however, this procedure is rare due to the risk for serious post-operative complications such as acute rejection and opportunistic infections [14].

Promising Complementary Therapies

Complementary therapies, such as home-based pulmonary rehabilitation, yoga, tai chi, geroprotectors, and the lung flute, show promise in COPD management. Patients may experience muscle weakness, decreased ability to exercise, disorders of the endocrine system, lung inflammation, anxiety, and depression [15] suggesting that therapies must be tailored to fit the needs of the individual patient [16].

Pulmonary rehabilitation

Exercise training, ongoing education, nutritional intervention, and psychosocial support are various components of pulmonary rehabilitation [17]. These components have been shown to relieve breathing difficulties, lessen fatigue, improve emotional function, and enhance an individual's sense of control over their COPD, respectively [18]. Typically, pulmonary rehabilitation occurs in both in-patient or outpatient clinic settings and requires a doctor's prescription. Approaches for these components vary in content, frequency, and other attributes. Home-based pulmonary rehabilitation has recently been shown to be an effective alternative with both short- and long-term benefits [19].

Yoga and Tai Chi

Studies have shown significant decreases in shortness of breath and increases in vital capacity and quality of life among elderly patients with COPD after they complete yoga programs of 6 weeks or more [20]. The programs included postures and controlled exhalations (e.g., [21]). Tai chi and mindful breathing may improve quality of life and exercise capacity [22].

Geroprotectors

Recent research suggests that aging is accelerated in COPD since the body is experiencing stress. Geroprotector therapy seeks to slow this aging process by reducing oxidative stress through fasting, supplemental melatonin, resveratrol (grapes, peanuts, red wine) and Nrf2 activators (broccoli). These interventions have promise in slowing the progression of COPD [23].

Lung Flute

People with COPD can use the Lung Flute® a small, self-powered, flute-shaped respiratory device, to generate sound waves that loosen respiratory secretions [24]. The user exhales vigorously into the device creating a sound wave that travels down the tracheobronchial tree where it vibrates lower respiratory tract secretions. The vibration enhances mucociliary clearance and the removal of sputum. Use of the Lung Flute has been associated with improvements in COPD symptoms and health status [25]. In the United States, the Lung Flute is approved by the Food and Drug Administration as a prescribed medical device.

Rocking beds

During the polio era, physicians observed improved breathing for patients in respiratory failure when using beds that rocked in a seesaw manner. In COPD, the diaphragm becomes flattened and inefficient. On a rocking bed, the patient's head (head of the bed) moves up during inhalation allowing gravity to assist the diaphragm in moving down. During exhalation, as the head of the bed lowers, intestinal viscera helps push the diaphragm up. Studies in the 1980s found improvements in O_2 saturation and CO_2 exhalation in these patients using gravity-powered ventilation [26]. Modernized rocking beds are currently under development and being evaluated for feasibility and treatment efficacy of alleviating COPD symptoms.

Conclusions

COPD is a complex disease that requires individualized treatment plans to address all affected body systems and their interactions that differ across people [27]. Therefore, a "one size fits all" approach is not adequate. Traditional COPD therapies using medications and surgery are invasive, pose numerous complications, and accompanied by negative side effects. Options for symptom alleviation and quality of life improvements are limited. The cause of COPD and cure remains elusive. However, researchers of patient-centered therapies are beginning to assemble models that alleviate symptoms and improve one's quality of life through mindfulness, yoga, nutrition, and the treatment of anxiety [28] as an adjunct to medications. In sum, complementary therapies show promise in improving the management of COPD symptoms.

References

1. Patel JG, Nagar SP, Dalal AA (2014) Indirect costs in chronic obstructive pulmonary disease: a review of the economic burden on employers and individuals in the United States. Int J Chron Obstruct Pulmon Dis 9: 289-300.
2. Boschetto P, Quintavalle S, Miotto D, Lo Cascio N, Zeni E, et al. (2006) Chronic obstructive pulmonary disease (COPD) and occupational exposures. J Occup Med Toxicol 1: 11.
3. Gronseth R, Haaland I, Wiker HG, Martinsen EM, Leiten EO, et al. (2014) The Bergen COPD microbiome study (MicroCOPD): rationale, design, and initial experiences. European Clinical Respiratory Journal 1: 26196.
4. Cox LA Jr (2011) A causal model of chronic obstructive pulmonary disease (COPD) risk. Risk Anal 31: 38-62.
5. Halbert RJ, Natoli JL, Gano A, Badamgarav E, Buist AS, et al. (2006) Global burden of COPD: systematic review and meta-analysis. Eur Respir J 28: 523-532.
6. Rabe KF, Hurd S, Anzueto A, Barnes PJ, Buist SA, et al. (2007) Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. Am J Respir Crit Care Med 176: 532-555.
7. Conti V, Corbi G, Manzo V, Pelaia G, Filippelli A, et al. (2015) Sirtuin 1 and aging theory for chronic obstructive pulmonary disease. Anal Cell Pathol (Amst) 2015: 897327.
8. Grimes GC, Manning JL, Patel P, Via RM (2007) Medications for COPD: a review of effectiveness. Am Fam Physician 76: 1141-1148.
9. Gershon A, Croxford R, Calzavara A, To T, Stanbrook MB, et al. (2013) Cardiovascular safety of inhaled long-acting bronchodilators in individuals with chronic obstructive pulmonary disease. JAMA Intern Med 173: 1175-1185.
10. Wilchesky M, Ernst P, Brophy JM, Platt RW, Suissa S (2012) Bronchodilator use and the risk of arrhythmia in COPD: part 1: Saskatchewan cohort study. Chest 142: 298-304.
11. Tricco AC, Strifler L, Veroniki AA, Yazdi F, Khan PA, et al. (2015) Comparative safety and effectiveness of long-acting inhaled agents for treating chronic obstructive pulmonary disease: A systematic review and network meta-analysis. BMJ Open 5.
12. Decramer ML, Hanania NA, Lötvall JO, Yawn BP (2013) The safety of long-acting β2 -agonists in the treatment of stable chronic obstructive pulmonary disease. International Journal of Chronic Obstructive Pulmonary Disease 8: 53â€“64.
13. Lumb A, Biercamp C (2014). Chronic obstructive pulmonary disease and anaesthesia. Continuing Education in Anaesthesia, Critical Care & Pain 14: 1-5.
14. Aziz F, Penupolu S, Xu X, He J (2010) Lung transplant in end-staged chronic obstructive pulmonary disease (COPD) patients: a concise review. J Thorac Dis 2: 111-116.
15. Moy ML, Teylan M, Danilack VA, Gagnon DR, Garshick E (2014) An index of daily step count and systemic inflammation predicts clinical outcomes in chronic obstructive pulmonary disease. Annual of the American Thoracic Society 11: 149-157.
16. Sze MA, Hogg JC, Sin DD (2014) Bacterial microbiome of lungs in COPD. Int J Chron Obstruct Pulmon Dis 9: 229-238.
17. Spruit MA, Pitta F, Garvey C, ZuWallack RL, Roberts CM, et al. (2014) Differences in content and organisational aspects of pulmonary rehabilitation programmes. European Respiratory Journal 43: 1326-1337.
18. McCarthy B, Casey D, Devane D, Murphy K, Murphy E, et al. (2015) Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane Database Syst Rev 2: CD003793.
19. Grosbois JM, Gicquello A, Langlois C, Le Rouzic O, Bart F, et al. (2015) Long-term evaluation of home-based pulmonary rehabilitation in patients with COPD. Int J Chron Obstruct Pulmon Dis 10: 2037-2044.
20. Fulambarker A, Farooki B, Kheir F, Copur AS, Srinivasan L, et al. (2012) Effect of yoga in chronic obstructive pulmonary disease. Am J Ther 19: 96-100.
21. Donesky-Cuenco D, Nguyen HQ, Paul S, Carrieri-Kohlman V (2009) Yoga therapy decreases dyspnea-related distress and improves functional performance in people with chronic obstructive pulmonary disease: A pilot study. Journal of Alternative Complementary Medicine 15: 225-234.
22. Yeh GY, Wayne PM, Litrownik D, Roberts DH, Davis RB, et al. (2014) Tai chi mind-body exercise in patients with COPD: study protocol for a randomized controlled trial. Trials 15: 337.
23. Ito K, Colley T, Mercado N (2012) Geroprotectors as a novel therapeutic strategy for COPD, an accelerating aging disease. Int J Chron Obstruct Pulmon Dis 7: 641-652.
24. Morrison L, Agnew J (2014) Oscillating devices for airway clearance in people with cystic fibrosis. Cochrane Database System Review 7: CD006842.
25. Sethi S, Yin J, Anderson PK (2014) Lung flute improves symptoms and health status in COPD with chronic bronchitis: A 26 week randomized controlled trial. Clinical and Translational Medicine 3: 1-8.
26. Goldstein RS, Molotiu N, Skrastins R, Long S, Contreras M (1987) Assisting ventilation in respiratory failure by negative pressure ventilation and by rocking bed. Chest 92: 470-474.
27. Gomez-Cabrero D, Lluch-Ariet M, Tegnér J, Cascante M, Miralles F, et al. (2014) Synergy-COPD: a systems approach for understanding and managing chronic diseases. J Transl Med 12: S2.

28. Chen Q, Wu C, Gao Y, Chen L, Liu Y (2015) A clinical study on the role of psychosomatic therapy in evaluation and treatment of patients with chronic obstructive pulmonary disease complicated with anxiety-depression disorder. International Journal of Clinical Experimental Medicine 8: 16613-16619.