International Research Journal of Education and Technology
Peer Reviewed Journal
ISSN 2581-7795

A RANDOMIZED CONTROLLED TRIAL TO DETERMINE THE EFFECTIVENESS OF AN INTERVENTIONAL PACKAGE AMONG COPD PATIENTS.

Mrs.Uma Rani.R.R Research Scholar,Shri Venkateshwara University.

Prof. Dr. Darling B Bibiana ,Research Scholar,Shri Venkateshwara University.

Introduction Chronic obstructive pulmonary disease (COPD) is characterised by decreased airflow due to airway obstruction. Air volume may become trapped in the lungs as a result of peripheral airway obstruction (i.e., hyperinflation). The respiratory rate may increase due to inspiration, which occurs prior to emptying the lungs of air. The adaptation of rapid shallow breathing may result in respiratory muscle fatigue. Hyperinflation can reduce the dome of the diaphragm, shorten respiratory muscle fibres, and impair muscle contraction. Furthermore, gas exchange may be inefficient. Because of this, people with COPD might have symptoms like shortness of breath or dyspnea.

Respiratory rehabilitation programmes for COPD include endurance exercise training, which helps people improve their physical fitness, as well as breathing techniques and strategies for living well with COPD.

Diaphragmatic breathing (DB), also called abdominal or deep breathing, is a way to breathe that involves contracting the diaphragm muscle, which is a dome-shaped sheet of muscle that runs horizontally between the thoracic cavity and the abdominal cavity.

It has been said, but not proven, that diaphragmatic breathing can correct abnormal chest wall motion, reduce work of breathing (WOB), dyspnea or shortness of breath (SOB), and improve ventilation. However, physiological studies on the effects of the different parts of pulmonary rehabilitation are lacking.

According to some studies, diaphragmatic breathing causes a significant increase in tidal volume, a decrease in respiratory rate, and an improvement in breathing pattern and respiratory efficiency in COPD patients. "Diaphragmatic breathing has been extremely beneficial to my ability to function in daily life and to the quality of my personal, recreational, and professional life," said one COPD patient.

However, there is some concern that diaphragmatic breathing may increase dyspnea and reduce the mechanical efficiency of breathing in patients with severe COPD and asynchronous thoraco-abdominal motion. So, it is important to find out if the effect of diaphragmatic breathing is different for people with different levels of disease.

The use of diaphragmatic breathing in people with COPD is still debated, but it is still used in physiotherapy practise. Some diaphragmatic breathing technique studies have measured abdominal expansion to determine the effect on diaphragmatic function, but it is unclear whether abdominal movement is specific to diaphragmatic muscle activity; it is entirely possible to expand the abdomen with little or no diaphragmatic involvement. As a result, direct measurement of diaphragmatic muscle activity may be a better outcome measure. It is not known how nutrition affects the effects of positioning and diaphragmatic breathing, but it is thought that a higher BMI, which may be linked to a higher amount of fat in the abdomen, may have a negative effect on diaphragm activity and the ability to recruit diaphragm activity during diaphragmatic breathing.

Diaphragmatic breathing (DB) and pursed-lip breathing have been shown to be effective in patients with chronic obstructive pulmonary disease (COPD) and reported improvement in maximal exercise tolerance in mild COPD patients who underwent DB and pursed-lip breathing but not in matched control patients. On the other hand, uncontrolled studies found that during DB, rib cage motion decreased and abdominal motion increased, but pulmonary function and exercise capacity did not change.

Recently, it was found that DB hurts coordination of chest wall movement and mechanical efficiency in patients with moderate to severe COPD who did not have respiratory insufficiency and had almost normal inspiratory muscle strength. However, the feeling of shortness of breath did not get better.

The researchers wondered what the effects of that approach might be in patients with more severe COPD, specifically those with chronic respiratory insufficiency recovering from an episode of acute respiratory failure. As a result, the purpose of this study was to look into the effect of deep DB on blood gases, breathing pattern, and dyspnea in severe hypercapnic COPD patients with reduced inspiratory muscle strength who were recovering from a recent exacerbation of their disease. We also looked at the effects of DB on pulmonary mechanics in a smaller group of patients.

Breathing control exercises (BCEs) and respiratory muscle training (RMT) are used to treat shortness of breath. BCEs such as diaphragmatic breathing (DB), pursed-lip breathing (PLB), relaxation techniques (RT), and body position exercises are examples of BCEs (BPEs). BCEs try to make breathing easier and help you relax by getting you to breathe deeper. This may improve your breathing pattern by slowing down your breathing and making you feel less out of breath.

The purpose of this study was to look at the short-term effect of deep diaphragmatic breathing on respiratory muscle activity (diaphragm and intercostal muscles) in COPD patients at Sree Ragavendra Hospital in Dharmapuri. 2. METHODOLOGY This study will be designed as a randomised control trial. Thirty male subjects will be screened, with fifteen subjects from each study group chosen for inclusion in the study. 1) Between the ages of 40 and 60 years old2) The subjects were chosen because they had a documented medical history of COPD and were receiving medical therapy with pulmonary drugs. 3) They were all smokers or former smokers with no clinical or physiological signs of bronchial asthma.

The criteria for exclusion 1) greater than 80 years of age2) Obesity 3) A history of recent exacerbations4) Pulmonary hypertension that is uncontrolled5) The need for home oxygen therapy

Diaphragmatic breathing exercises will be performed only for the study group. The control group received only medical treatment. Blood gas percentage, PaO2, PaCO2, and PaO2/FiO2 measurements

Sree Ragavendra Hospital in Dharmapuri is the location. 3. OUTCOMES Ninety-four patients were evaluated for eligibility, and 30 were assigned to groups at random. The CG had three protocol deviations due to either an acute COPD exacerbation or other health issues. These patients were kept in order to comply with the intention-to-treat analysis. There was no difference in baseline disease severity, functional capacity, anthropometric data, or other baseline characteristics between groups.

Mobilities of the Thoracoabdomen and Diaphragm When compared to the CG, the TG showed greater abdominal motion during NB immediately after the 4-week DBTP, as measured by a decrease in the RC/ABD ratio (F8.66; P.001). The TG also had more abdominal motion during voluntary DB after the intervention than the CG (F4.11; P.05). All TG patients demonstrated DB competency. Finally, the TG demonstrated greater diaphragmatic mobility following the 4-week DBTP than the CG (F15.08; P.001). The effect sizes in favour of the TG on diaphragmatic mobility (d.46) and the RC/ABD ratio during both voluntary DB (d.69) and NB were medium to large (d.96). In CG patients, the RC/ABD ratio and diaphragmatic mobility remained unchanged.

performance abilityAfter the 4-week DBTP, the TG had less dyspnea than the CG (F5.1; P.05). A 10-point reduction in the total SGRQ score indicated an improvement in HRQOL for the TG (F9.7; P.001). The benefits of the TG in different SGRQ domains (symptom and impact) were statistically significant and clinically relevant when compared to the CG. However, there was no change in the TG for the activity domain. Finally, after a 4-week follow-up period, the TG performed better in the 6MWT than the CG (F4.9; P.05). The effect sizes in favour of the TG on the 6MWT (d.31), dyspnea (d–.41), and HRQOL were small to medium (d–.64). Both groups' spirometry and lung volume data remained unchanged.

Improvement in Abdominal Motion and Baseline Characteristics Have a Linear Relationship The improvement in abdominal motion (RC/ABD ratio) after DBTP was inversely related to the baseline RC/ABD ratio (r-0.8; P.001) and diaphragmatic mobility (r-0.8; P.001) (r.58; P.02). The bottom right area reveals that the majority of patients who improved their abdominal motion had a costal breathing predominance (RC/ABD ratio of 0.5). Patients who had lower baseline diaphragmatic mobility improved more in abdominal motion after DBTP. Changes in abdominal motion in the TG did not correlate with any other baseline outcomes. After a 4-week follow-up period, the RC/ABD ratio was unrelated to the baseline RC/ABD ratio or diaphragmatic mobility in the CG (P.05).

DISCUSSION The purpose of this RCT was to look into the isolated effects of a short-term DBTP in COPD patients. It demonstrated an increase in diaphragmatic mobility as well as an improvement in abdominal motion during NB and voluntary DB. We also discovered that DBTP improves dyspnea symptoms, HRQOL, and exercise tolerance. These findings support the hypothesis that DBTP can alter habitual breathing patterns and increase diaphragmatic excursion, thereby relieving symptoms and improving functional capacity in COPD patients. Patients were able to move their stomachs more during voluntary DB, which is in line with what has been found before.

For starters, our training programme was longer (12 sessions vs. 9). Second, in their study, DB was only performed in the supine and sitting positions, whereas DB was also performed in the lateral decubitus and standing positions in our programme. Third, our patients had less airflow obstruction than Gosselink's patients (43% vs 34% FEV1). Finally, all of our patients were considered competent to perform DB after the intervention, whereas the other study provided no description of DB competency. All of the differences between studies could explain why our patients got better.

Diaphragmatic dysfunction is a significant consequence of respiratory changes in COPD patients. Patients with reduced diaphragmatic mobility (33.99 mm) have lower exercise tolerance and more dyspnea after physical effort, according to previous research. Patients in both groups had impaired diaphragmatic mobility at baseline, as evidenced by a lower excursion than the critical point for diaphragmatic dysfunction (33.99mm), and only patients who participated in DBTP improved diaphragmatic mobility beyond the point of impairment. Based on these results, it is likely that more diaphragmatic mobility will improve the symptoms of dyspnea and the ability to function.

It has been demonstrated that both increased activity of chest wall respiratory muscles and decreased diaphragm activity are associated with increased dyspnea sensations. This suggests that interventions aimed at reversing the overuse of chest wall respiratory muscles and improving diaphragmatic function could help COPD patients with dyspnea. Patients who participated in DBTP had higher abdominal motion during NB and higher diaphragmatic mobility after the training, as well as a reduction in dyspnea symptoms, according to our findings. Based on these results, we can guess that the decrease in shortness of breath may be caused in part by more use of the diaphragm and less use of the chest wall breathing muscles.

CONCLUSIONS- The researchers conclude that DBTP improves abdominal motion during NB and functional capacity in COPD patients. The researchers also discovered that patients with a predominance of costal breathing and poor diaphragmatic mobility had a greater improvement in abdominal motion. These patients are most likely better candidates for DB training. As a result, this study emphasises the significance of DB as an adjunctive treatment modality for COPD patients.

. REFERENCES

1. Lacasse Y, Wong E, Guyatt GH, Cook DJ, Goldstein RS. Meta-analysis of respiratory rehabilitation in chronic obstructive pulmonary disease. Lancet 1996; 348: 1115–1119.

2. Lacasse Y, Guyatt GH, Goldstein RS. The components of a respiratory rehabilitation program. A systematic overview. Chest 1997; 111: 1077–1088.

3. Faling LJ. Controlled breathing techniques and chest physical therapy in chronic obstructive pulmonary disease and allied conditions. In: Casaburi R, Petty TL, eds. The Principles and Practice of Pulmonary Rehabilitation. Philadelphia, Saunders WB, 1993; pp. 167–182.

4. Ambrosino N, Paggiaro PL Macchi M, et al. A study of short-term effect of rehabilitative therapy in chronic obstructive pulmonary disease. Respiration 1981; 41: 40–44.

5. Sackner MA, Gonzales HF, Jenouri G, Rodriguez M. Effects of abdominal and thoracic breathing on breathing pattern components in normal subjects and in patients with COPD. Am Rev Respir Dis 1984; 130: 584–587.

6. Grimby G, Oxhoj H, Bake B. Effects of abdominal breathing on distribution of ventilation in obstructive lung disease. J Rehab Sci 1993; 6: 66–87.

7. Williams IP, Smith CM, McGavin CR. Diaphragmatic breathing training and walking performance in chronic airways obstruction. Br J Dis Chest 1982; 76: 164–166

. 8. Gosselink RAM, Wagenaar RC, Rijswijk H, Sargeant AJ, Decramer MLA. Diaphragmatic breathing reduces efficiency of breathing in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1995; 151: 1136–1142.

9. ATS statement. Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1995; 152: S77–S120.

10. Siafakas NM, Vermeire P, Pride NB, et al. ERS Consensus Statement. Optimal assessment and management of chronic obstructive pulmonary disease (COPD). Eur Respir J 1995; 8: 1398–1420.

11. Breslin EH, Garoutte BC, Kohlman-Carrieri V, Celli BR. Correlations between dyspnea, diaphragm and sternomastoid recruitment during inspiratory resistance breathing in normal subjects. Chest 1990; 98: 298-302.

12. Paulin E, Yamaguti WP, Chammas MC, et al. Influence of diaphragmatic mobility on exercise tolerance and dyspnea in patients with COPD. Respir Med 2007; 101: 2113-8.

13. Nici L, Donner C, Wouters E, et al. American Thoracic Society/European Respiratory Society statement on pulmonary rehabilitation. Am J Respir Crit Care Med 2006; 173: 1390-413.

14. Dechman G, Wilson CR. Evidence underlying breathing retraining in people with stable chronic obstructive pulmonary disease. Phys Ther 2004; 84: 1189-97.

15. Cahalin LP, Braga M, Matsuo Y, Hernandez ED. Efficacy of diaphragmatic breathing in persons with chronic obstructive pulmonary disease: a review of the literature. J Cardiopulm Rehabil 2002; 22: 7-21.

16. McNeill RS, McKenzie JM. An assessment of the value of breathing exercises in chronic bronchitis and asthma. Thorax 1955; 10: 250-2.

17. Tandon MK. Adjunct treatment with yoga in chronic severe airways obstruction. Thorax 1978; 33: 514-7.

18. Ambrosino N, Paggiaro PL, Macchi M, et al. A study of short-term effect of rehabilitative therapy in chronic obstructive pulmonary disease. Respiration 1981; 41: 40-4.

19. Vitacca M, Clini E, Bianchi L, Ambrosino N. Acute effects of deep diaphragmatic breathing in COPD patients with chronic respiratory insufficiency. Eur Respir J 1998; 11: 408-15.

20. Ito M, Kakizaki F, Tsuzura Y, Yamada M. Immediate effect of respiratory muscle stretch gymnastics and diaphragmatic breathing on respiratory pattern. Respiratory Muscle Conditioning Group. Intern Med 1999; 38: 126-32.

21. Brach BB, Chao RP, Sgroi VL, Minh VD, Ashburn WL, Moser KM. 133Xenon washout patterns during diaphragmatic breathing. Studies in normal subjects and patients with chronic obstructive pulmonary disease. Chest 1977; 71: 735-9.