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Breathing Retraining: A best practice for COPD

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Abstract
COPD [Chronic Obstructive Lung Disease] is one of several chronic diseases that are becoming increasingly problematic worldwide nowadays. Low- and middle-income countries already have much of the burden of COPD. Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines have identified the goals of treatment for patients with COPD, these include the patients' goals of improved breathing pattern [exercise tolerance] and emotional function (health-related quality of life), clinical goals such as prevention of disease progression and minimization of symptoms . Nurses care for patients with COPD across the spectrum of care, from outpatient and home care to emergency department, critical care and hospice settings. Many reviews shown the commonest techniques to reduce dyspnea that are being applied to patients with Chronic Obstructive Lung Disease (COPD) subjected to a pulmonary rehabilitation program (PRP) are breathing retraining strategies. The Pursed lip breathing (PLB) and diaphragmatic breathing (DB) are breathing retraining strategies employed by COPD patients in order to relieve and control dyspnea. Through breathing retraining we can improve their breathing pattern along with routine medical care. Patient & family teaching is an important nursing intervention to enhance self-management in patients with COPD.

Keywords: breathing retraining, COPD, chronic diseases

Introduction

Chronic Obstructive Lung Disease (COPD) is one of the major preventable chronic respiratory diseases (CRD). In COPD there is problem in expiration. [Unable to expel the air]
The Global Initiative for Obstructive Lung Disease (GOLD) describes COPD as a common preventable and irreversible disease, characterised by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases.
Chronic Obstructive Lung Disease (COPD) is one the most widespread diseases around the world. According to WHO estimates, about 210 million people around the world suffer from COPD. By 2030 COPD will become the third leading cause of death worldwide. Many people expose themselves to the main risk factors, such as smoking, air pollution, dust and chemicals
World COPD Day (also known as World Chronic Obstructive Pulmonary Disease Day) is annually observed on the second or third Wednesday in November (mostly the third). This international observance was created in 2002.
The observance is supported by the World Health Organization and annually various educational and preventive events are held in over 50 countries around the world. The events include educative evenings, openings of health clinics, free pulmonary function tests etc.

2018 theme for World COPD Day will be "Never too early, never too late",

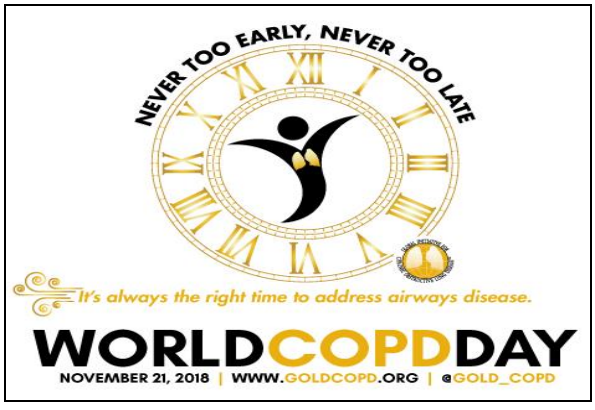

Fig 1

COPD [Chronic Obstructive Pulmonary Disease] ; Describes group of lung conditions that make it difficult to empty air out of the lungs because airways have been narrowed. With this breathing difficulty they are unable to lead good quality of life. Breathing retraining is one among the special care given by the nursing professionals to improve the quality of life for patients with COPD.

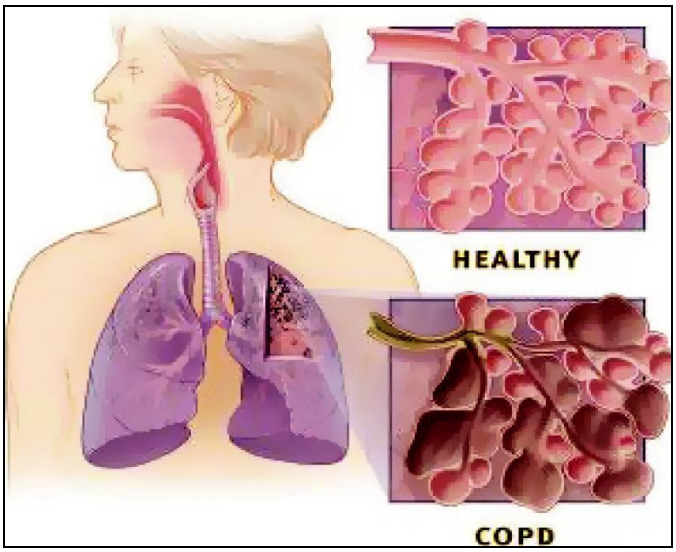

Fig 2

Breathing retraining: A best practice for COPD

The breathing pattern of most people with COPD is shallow, rapid and inefficient; the most severe the disease, the more inefficient the breathing pattern. Breathing retraining aims to alter respiratory muscle recruitment in order to reduce dyspnoea and improve respiratory muscle performance with practice of breathing retraining, upper chest breathing can be changed to diaphragmatic breathing which reduces the respiratory rate, increases alveolar ventilation, and sometimes helps to expel as much air as possible during expiration. It also promotes relaxation, enabling the patient to gain control of dyspnea and reduce feelings of panic.

The following two breathing techniques that can helps to get the air needed without working so hard to breathe:

Pursed-lips breathing and Diaphragmatic (also called Belly or Abdominal) Breathing.

Better Breathing Tip: It's normal to hold your shoulders tense and high. Before starting any breathing technique, take a minute to drop your shoulders down, close your eyes, and relax.

Pursed-Lips Breathing

This breathing technique helps, slow your breathing down and stay calm. Pursed -lips breathing should be used during and after exercise.

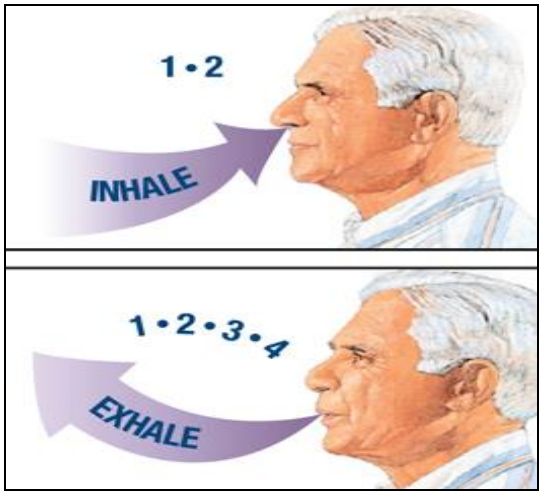

Fig 3

Review of literature shows studies related to effectiveness of breathing retraining among patients with COPD .The following studies results shows that the breathing retraining exercises plays vital role in pulmonary rehabilitation among patients with COPD.

- Faager G, Stâhle A, Larsen FF (2012) conducted a randomized open-label, cross-over study on Influence of spontaneous pursed lips breathing on walking endurance and oxygen saturation in 32 patients with moderate to severe chronic obstructive pulmonary disease. All patients performed two endurance shuttle walking tests I &II [a mouthpiece & spontaneous pursed lips breathing] in random order. The results showed that when spontaneous pursed lips breathing was used the patients walked on an average for 37 seconds (16%) longer (P<0.01) than when pursed lips breathing was prevented. The patients desaturated considerably during both walking tests but the average drop in oxygen saturation was 1.2% less when spontaneous pursed lips breathing was employed.
- Sudo E, *et al*. (2010) [1] conducted randomized control study to test the effects of pulmonary rehabilitation among 7 patients with COPD (aged 76.0 +/- 2.6 years) for 6 weeks. The program consisted of relaxation, pursed lip breathing, diaphragmatic breathing, panic control, muscle stretch gymnastics, and exercise training. The result of the study revealed that the distance of the 6-minute walking test increased significantly from 246.4 +/- 38.0 (m) to 304.3 +/- 28.4 (m) (p < 0.05). The minimum SpO2 during the 6-minute walking test increased from 86.0 +/- 2.8 (%) to 90.1 +/- 1.3 (%) and dyspnea as measured with Borg scale decreased from 5.6 +/- 1.1 to 4.6 +/- 0.5. These results suggested that pulmonary rehabilitation might improve exercise tolerance in elderly patients with COPD.
- Nield MA, *et al*. (2007) [9] conducted A randomized clinical control trial on Efficacy of pursed-lips breathing: a breathing pattern retraining strategy for dyspnea reduction.

To compare 2 programs of prolonging expiratory time (pursed-lips breathing and expiratory muscle training) on dyspnea and functional performance among 40 patients with COPD undergone pursed-lips breathing & expiratory muscle training for 12 weeks. Changes over time in dyspnea [modified Borg after 6-minute walk distance (6MWD) and Shortness of Breath Questionnaire] and functional performance (Human Activity Profile and physical function scale of Short Form 36-item Health Survey) were assessed with a multilevel modeling procedure. The results of the study shown **s**ignificant reductions for the modified Borg scale after 6MWD (P = .05) and physical function (P = .02) from baseline to 12 weeks were only present for pursed-lips breathing.

Pursed-lips breathing provided sustained improvement in exceptional dyspnea and physical function.

i) Beneficial effects;

- Slows breathing down
- Keeps airways open longer so lungs can get rid of more stale, trapped air
- Reduces the work of breathing
- Increases the amount of time to exercise or perform an activity
- Improves the exchange of oxygen and carbon dioxide

ii) Technique

To do pursed-lips breathing

1. Breathe in through your nose (as if you are smelling something) for about 2 seconds.
2. Pucker your lips like you're getting ready to blow out candles on a birthday cake.
3. Breathe out very slowly through pursed-lips, two to three times as long as you breathed in Repeat.

iii) Practice guide

Practice this 2 to 3 times a day for 5 to 10 minutes

Breathing from the diaphragm

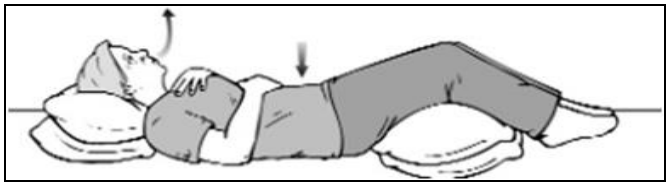

Fig 4

This type of breathing is also called abdominal breathing. Your abdomen should move down when you breathe in. It should rise as you breathe out. The diaphragm is the main muscle of breathing. It's supposed to do most of the work. When you have COPD, the diaphragm doesn't work as well and muscles in the neck, shoulders and back are used. These muscles don't do much to move your air. Training your diaphragm to take over more "work of breathing" can help. Literature reviews shows that diaphragmatic breathing serving as a good intervention for patients with COPD.

Some of the supporting studies are

- Jones AY, Dean E, Chow CC [2003] conduced randomised clinical control study on Comparison of the oxygen cost of breathing exercises and spontaneous breathing among thirty subjects with stable, moderately severe COPD. Subjects have performed 3 breathing exercises in random order, with a rest between exercises: diaphragmatic breathing (DB), pursed-lip breathing (PLB), and a combination of DB and PLB (CB). Oxygen consumption and respiratory rate were measured. The results of the study shown mean VO2 (SD) was lower during the breathing exercises (165.8 +/- 22.3 mL O2/min for DB, 164.8 +/- 20.9 mL O2/min for PLB, and 167.7 +/- 20.7 mL O2/min for CB) compared with SB (174.5 +/- 25.2 mL O2/min). Correspondingly, mean RR (+/- SD) was higher during SB (17.3 +/- 4.23 breaths/min), followed by DB (15.0 +/- 4.32 breaths/min), PLB (12.8 +/- 3.53 breaths/min), and CB (11.2 +/- 2.7 breaths/min).
- Yamaguti WP, *et al*. conducted randomised controlled clinical trial on Diaphragmatic breathing training program improves abdominal motion during natural breathing in patients with chronic obstructive pulmonary disease instructed to perform 3 series of 10 maximally inspirations, predominantly with abdominal motion, while reducing upper rib cage motion in a supine position for 4 weeks. The results revealed that there is reduction of dyspnoea, respiratory rate and improved breathing pattern.

Beneficial effects

Use and strengthen the diaphragm during breathing.

Technique

This technique is best used when you're feeling rested and relaxed, and while sitting back or lying down.

1. Place one hand on your abdomen. Place one hand on your upper chest.
2. Focus your breathing on your abdomen.
3. As you breathe out, the hand on your abdomen should lower.
4. As you breathe in, the hand on your abdomen should rise.
5. Breathe in through the nose. Breathe out slowly through pursed lips.

Practice guide

Practice this 2 to 3 times a day for 5 to 10 minutes. Start by doing it while lying on your back. Then try it while sitting. Then try it while standing. Finally, try it while doing an activity.

Conclusion

Breathing retraining in COPD is safe and improves breathing pattern, exercise capacity & reduce dyspnea. The patient's functional quality of life is improved through this breathing strategies. So breathing retraining is best practice for COPD.

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