

## COMMENTARY

## **Pulmonary Rehabilitation: A new hope for Chronic Obstructive Pulmonary Disease Patients**

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### **Introduction**

Respiratory diseases are one of the leading causes of morbidity and mortality that are increasing all over the world. Among all the respiratory diseases, Chronic Obstructive Pulmonary Disease (COPD) is the most common cause of respiratory disorder and leading cause of lung-related death and disability [1]. It is predicted by WHO that by 2020, COPD will become the third leading cause of death (currently fourth) and the fifth leading cause of disability (currently twelfth) worldwide [2].

### **Pathophysiology of COPD:**

Chronic obstructive pulmonary disease (COPD) is characterized by chronic airflow limitation which is progressive and not fully reversible. It is associated with significant extra-pulmonary effects that may contribute to the severity of the disease in individual patients. The characteristic pathological changes of COPD are due to inflammatory cells and inflammatory mediators, impaired gas exchange, oxidative stress and proteases and anti-proteases imbalance [3]. Several recent studies have shown that COPD is associated not only with an abnormal inflammatory response of the lung parenchyma but also with systemic inflammation. These include systemic oxidative stress, activation of circulating inflammatory cells and increased level of pro-inflammatory cytokines. Inflammatory mediators and activated inflammatory cells such as CRP, IL-6, IL-8 are released in to the systemic circulation in COPD [4].

### **Origin of dyspnea and functional limitation:**

Patients with COPD suffer a downhill course. As they have progressive and chronic airflow limitation it leads to a gradual increase in breathlessness on exertion. Increase in dyspnea limits the patients functional exercise capacity and forces them to abstain from moderate exertion. Systemic inflammation along with prolonged steroid intake leads to decreased immunity and myopathy. Immuno-suppression and destruction of the normal architecture of the lungs makes them more prone to infections. Airway inflammation and increased secretions due to infections impairs gas exchange resulting in hypoxia during rest and exertion. Chronic hypoxia leads to oxidative stress and free radical injury. Prolonged disuse, recurrent free radical injury, steroid induced myopathy, malnutrition and hypoxia; culminates in severe skeletal muscle and inspiratory muscle dysfunction and early fatigue leading to dyspnea and disability in activities of daily living. Since patients have limited activity, they avoid going out in the community lest they get breathless and end up in an embarrassing situation, thus becoming socially isolated. Frequent hospital visits and functional

disability affects their efficiency at home and work, resulting in them, becoming a socioeconomic burden.

### **Role of Pulmonary Rehabilitation:**

Pulmonary rehabilitation has emerged as a recommended standard of care for chronic lung disease patients. It is an evidence-based, multidisciplinary and comprehensive non-pharmacological intervention for patients with chronic respiratory diseases who are symptomatic and often have decreased daily life activities [5-6]. Integrated into the individualized treatment of the patient, the primary goal of pulmonary rehabilitation is to restore the patient to the highest possible level of independent functioning. This goal is achieved by helping patients become more physically active, to understand their disease, treatment options, correct use of medications and various coping strategies. Patients are encouraged to become actively involved in providing their own health care, and are less dependent on health professionals and expensive medical resources. Rather than focusing solely on reversing the disease process, rehabilitation attempts to reduce symptoms and reduce disability from the disease. Programs typically include components such as patient assessment, breathing retraining, exercise training, education, bronchial hygiene, nutritional intervention, and psychosocial support.

In addition to COPD, pulmonary rehabilitation is beneficial to patients with other chronic lung conditions such as interstitial diseases, cystic fibrosis, bronchiectasis, and thoracic cage abnormalities [7]. It has also been used successfully as part of the evaluation and preparation for surgical treatments such as lung transplantation and lung volume reduction surgery.

### **References**

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Pulmonary rehabilitation, also known as respiratory rehabilitation, is an important part of the management and health maintenance of people with chronic respiratory disease who remain symptomatic or continue to have decreased function despite standard medical treatment. It is a broad therapeutic concept. It is defined by the American Thoracic Society and the European Respiratory Society as an evidence-based, multidisciplinary, and comprehensive intervention for patients with chronic respiratory disease. Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung disease that causes obstructed airflow from the lungs. Symptoms include breathing difficulty, cough, mucus (sputum) production and wheezing. It's typically caused by long-term exposure to irritating gases or particulate matter, most often from cigarette smoke. People with COPD are at increased risk of developing heart disease, lung cancer and a variety of other conditions. Emphysema and chronic bronchitis are the two most common conditions that contribute to COPD. These two conditions usually occur together and c

Background: Widespread application of pulmonary rehabilitation (also known as respiratory rehabilitation) in chronic obstructive pulmonary disease (COPD) should be preceded by demonstrable improvements in function (health-related quality of life, functional and maximal exercise capacity) attributable to the programmes. This review updates the review reported in 2006. Objectives: To compare the effects of pulmonary rehabilitation versus usual care on health-related quality of life and functional and maximal exercise capacity in persons with COPD. Search methods: We identified additional randomi

Chronic obstructive pulmonary disease is usually suspected in people who experience the symptoms described above and can be confirmed by a breathing test called "spirometry" that measures how much and how quickly a person can forcibly exhale air. Chronic obstructive pulmonary disease is not curable. However, available medical and physical treatments can help relieve symptoms, improve exercise capacity and quality of life and reduce the risk of death. The most effective and cost-effective available treatment for COPD in people who continue to smoke is smoking cessation. Asthma patients are enrolled in multimodal pulmonary rehabilitation (PR) programs. However, available data for the effectiveness of PR in asthma are sparse. Pulmonary rehabilitation (PR) is widely accepted as an effective treatment for patients with chronic respiratory diseases, especially for chronic obstructive pulmonary disease (COPD) [5]. In Europe and North America, asthma patients are also commonly enrolled in PR programs [6], but the available data regarding the effectiveness of PR for asthma patients are sparse.