3. COPD: Non-Pharmacologic Treatment

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Introduction

Chronic obstructive pulmonary disease (COPD) is characterized by an incompletely reversible limitation in airflow. The overall approach to managing stable COPD should be applied by a stepwise increase in treatment, depending on the severity of the disease. Although airflow obstruction is the most obvious and the most studied manifestation of COPD, it should not be overlooked that COPD is associated with many extrapulmonary features that contribute to the morbidity, reduced quality of life, and, possibly, mortality of this disease. In the management of COPD, it is important to perform systemic care, in addition to bronchodilating treatment. The management of COPD involves pharmacologic and non-pharmacologic treatments. Non-pharmacologic treatment involves smoking cessation, pulmonary rehabilitation, oxygen therapy, ventilatory support (noninvasive mechanical ventilation, conventional mechanical ventilation), surgical treatments (lung volume reduction surgery, lung transplantation) and nutrition support.

1. Smoking Cessation

Smoking is the main risk factor of COPD, causing airflow limitation and accelerating the reduction in pulmonary functions. Early diagnosis of COPD offers the best opportunity to slow the progression of the disease through smoking cessation. Smoking cessation is the most effective way to reduce the risk of developing COPD. It prevents or delays the development of airflow limitation and also reduces its progression. The most effective intervention for prolonged smoking cessation in patients with COPD is the combination of nicotine replacement therapy, coupled with an intensive, prolonged relapse prevention programme.

2. Comprehensive Pulmonary Rehabilitation

Pulmonary rehabilitation, the most important non pharmacological treatment in patients with COPD, has a primary

goal to achieve the highest possible level of individual exercise tolerance, thus reducing the primary and/or secondary health care utilization. The impaired function of ambulation muscles causing breathlessness as one of the more frequent symptoms in many COPD, suggests that training the lower extremities is the most important goal to achieve during pulmonary rehabilitation of these patients. On the other hand, as muscle strength appears to be an independent contributor to survival and the utilization of health care resources, it seems largely justified also to include this further modality in the pulmonary rehabilitation program of these patients.

Pulmonary rehabilitation is, in principle, a team medical effort. An even greater positive effect can be anticipated by having a multiprofessional team working on an comprehensive program. Exercise therapy is a central structural component of pulmonary rehabilitation. When starting exercise training, it is desirable to condition the patient by adjusting their breathing patterns and providing them with flexibility training to ensure efficient exercise training. Exercise training should be performed continuously and regularly, as in the correct practice of regular inhalation pharmacologic therapy. Following the induction phase of the program, the maintenance phase consists of central components including endurance and muscle strength training. By this time it is desirable for the patients to have formed an exercise habit and incorporated it into their lifestyle.

3. Patient Education

Patient education occupies an extremely important position in all processes of prevention, diagnosis and management of COPD. The most effective educational method is to conduct patient education systematically in a programmed comprehensive pulmonary rehabilitation. In the management of COPD and other chronic diseases, adherence to the treatment must be enhanced.

4. Nutrition Management

Poor nutritional status is associated with an increased in-

cidence of morbidity and mortality in patients with COPD. The development of respiratory failure and cumulative mortality are high in patients in which loss of body weight is seen. Loss of body weight (decrease in %IBW, BMI) is a prognostic factor independent of air-flow limitation. While a number of factors have been shown to produce tissue catabolism, no single mechanism has been clearly identified as a primary cause for weight loss in patients with severe COPD. Dietary treatment is indicated in cases of COPD in which %IBW <90%. Particularly, cases in which %IBW <80% accompany decrease in LBM. This is a strong indication for a very positive initiation of nutritional supplementation therapy. However, there is no consensus concerning the most appropriate treatment method, including prevention, thus this topic must be studied further. Without a clear understanding of the etiology of weight loss, therapeutic strategies to reverse this process have historically been unsuccessful.

5. Oxygen Therapy

Long-term oxygen therapy (LTOT) has become quite popular over the last 20 years due to better knowledge of the beneficial effect (improved survival rate, improved quality of life, stabilization of the pulmonary hypertension) and to technological progress.

Oxygen therapy is indicated in cases of severe chronic respiratory failure in patients with a PaO_2 of 55 Torr or less, or in cases with PaO_2 of 60 Torr or less in whom there is remarkable hypoxia during sleep or during exercise, and in whom the physician believes home oxygen therapy is necessary. The decision on the indication for the procedure can be made based on the measurement of PaO_2 or by pulse oxymeter oxygen saturation measurement.

During induction, it is important to educate not only the patient, but also the family, concerning the oxygen therapy. Patient compliance is however often insufficient. In addition to education, the best way to improve patient participation is to strive for improved quality of life with oxygen therapy (portable device, liquid oxygen) in these patients.

6. Ventilatory Support

Home ventilation is a growth area. Rapid expansion during the 1990s was stimulated by the development of noninvasive intermittent positive pressure ventilation (NIPPV) via

a mask and the recognition that an increased number of patient groups can benefit. It is important to have the support of a comprehensive approach based on a multiprofessional medical team for the introduction and continuation of mechanical ventilation therapy.

Home ventilation in COPD patients remains controversial. Multicentric randomised controlled trials of LTOT versus NIPPV plus LTOT in COPD have produced mixed results, although certain subgroups, e.g. those with recurrent infective exacerbations requiring short-term NIPPV, patients aged >65 years, and those with uncontrolled hypercapnia on LTOT or symptomatic nocturnal hypoventilation, may benefit.

7. Lung Volume Reduction Surgery (LVRS)

Lung-volume reduction surgery can result in demonstrable benefit in selected subgroups of COPD patients with upper-lobe disease and poor exercise capacity before surgery with improvements in six-minute walk distances, forced expiratory volume in the first second (FEV_1), dyspnea scores and quality-of-life scores, and decreases in residual volume (RV) as well as the need for supplemental oxygen. Patients with FEV_1 of less than 20% of predicted and either homogeneous emphysema or diffusing capacities (D_{LCO}) of less than 20% of predicted do not benefit from LVRS and have unacceptable peri-operative mortalities (NETT study).

8. Lung Transplantation

COPD is the most frequent indication of lung transplantation worldwide. Changes in technique, immunosuppression regimens, and treatment of infectious complications have led to improvements in survival and functional results. Current areas of discussion concern the use of single lung transplantation versus bilateral sequential lung transplantation and the criteria for allocating donor lungs.

9. Home Management

Home management treatment is based on respect for the wishes and hopes of the patient, and is intended to release the patient from the restrictive environment of hospitalization, while enhancing the environment of the home, to increase the level of QOL of the patient and the family, enabling support for a more independent lifestyle.