



## EDITORIAL

# Series on comprehensive management of end-stage COPD

N. Ambrosino\* and R. Goldstein#

**C**hronic obstructive pulmonary disease (COPD) affects 6% of the general population and is a leading cause of morbidity and mortality worldwide. Severe and very severe disease, as defined by Global Initiative for Chronic Obstructive Lung Disease (GOLD) stages III and IV [1], show a prevalence of 4.5 and 2.2% in males [2, 3]. COPD guidelines generally do not address patients with end-stage disease, although such patients are frequently seen in clinical practice by family physicians and respiratory specialists [2, 4]. In the brief series starting in the current issue of the *European Respiratory Journal*, we review the management of such patients, beginning with the definition, epidemiology and natural history of their condition, as described by VIEGI *et al.* [5].

End-stage COPD patients have the most severe airflow limitation, the highest levels of dyspnoea and the worst health-related quality of life [6]. Their condition has great impact on their ability to engage in activities and on their participation in social, professional and leisure activities. Their exercise tolerance is markedly reduced by dyspnoea and fatigue, and they have frequent respiratory exacerbations, which often result in hospitalisation. Their gas exchange is usually abnormal, with hypoxaemia requiring supplemental oxygen therapy, and hypercapnia requiring consideration of ventilatory support. These are the patients most likely to experience the worst secondary impairments of COPD, including peripheral muscle, nutritional and psychological dysfunction [7]. Nutritional depletion is a common problem in end-stage COPD, caused by an imbalance between low energy intake and high energy requirements [8], contributing to muscle dysfunction [9] associated with a poor prognosis [10, 11].

These are also the patients most likely to have the largest number of comorbidities, both smoking related and otherwise. Reduced exercise capacity and peripheral muscle dysfunction may be linked by the presence of systemic inflammation [12, 13]. These topics will be addressed in a specific review by FABBRI *et al.* [14].

ALBERT and CALVERLEY [15] will focus on drug therapy (including oxygen) for these patients. Pharmacological therapy for this population is likely to include all three of the main groups, *i.e.* long-acting  $\beta$ -agonists, long-acting anti-cholinergics and inhaled corticosteroids, as clinicians attempt to improve airflow and diminish inflammation. Despite the fact that many patients with end-stage disease do not demonstrate reversibility of their forced expiratory volume in one second during pulmonary function testing, some do show an increase in their inspiratory capacity and a diminution of hyperinflation, changes known to be associated with a reduction in dyspnoea and an improvement in exercise capacity. There are few pharmacological studies that specifically address the patient with end-stage disease. However, it is becoming clear that low-dose morphine or other opiates may significantly reduce dyspnoea without significantly accelerating death [16, 17].

Another pharmacological treatment, supplemental oxygen therapy, has been shown in landmark studies to be life saving for those with resting hypoxaemia, an observation that has given rise to domiciliary oxygen programmes around the world.

The more challenging issues in the management of patients with end-stage lung disease relate to the application of oxygen for transient hypoxaemia, at night or during exercise, or the relief of dyspnoea [18, 19]. In addition to the life-saving benefits of long-term oxygen therapy, the use of mechanical ventilatory support, though of vital help as a temporary measure for acute respiratory failure, has yet to be shown to be consistently useful for patients with chronic respiratory failure.

As with most COPD patients who have more than mild disease, management is more effective when pharmacological and nonpharmacological approaches are combined; a topic addressed by AMBROSINO and CLINI [20]. To this end, pulmonary rehabilitation has been shown to improve health-related quality of life, even amongst the most severe patients [21–23]. There remains a substantial service gap between those likely to benefit from pulmonary rehabilitation and the number of available programmes. This gap is likely to be narrowed by the establishment of community and home-based programmes that emphasise disease self-management and prompt access to professional help when required. Pulmonary rehabilitation is also an important treatment modality for patients with end-stage lung disease being considered for lung transplantation. Results of the latter are limited by complications that impair survival, the most important of which is bronchiolitis obliterans [24].

\*Pulmonary Unit, Cardio-Thoracic Dept, University Hospital Pisa, Pisa, Italy. #Dept of Medicine, University of Toronto, Toronto, ON, Canada.

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CORRESPONDENCE: N. Ambrosino, U.O. Pneumologia, Dipartimento Cardio-Toracico, Azienda Ospedaliero-Universitaria Pisana, Via Paradisa 2, Cisanello, 56124 Pisa, Italy. Fax: 39 50996779. E-mail: n.ambrosino@ao-pisa.toscana.it

As the reader will learn from LACASSE and GOLDSTEIN [25], health-related quality of life is markedly influenced by psychological impairments, whether associated with symptoms of anxiety and depression, commonly identified in patients with COPD, or in the form of a major anxiety or depressive disorder requiring prompt management to enable the patient to function. This is especially noticeable among patients who survive a period of intensive care, in whom anxiety and depression are common and quality of life is poor [26]. Candidates for lung transplantation exhibit a variety of neurocognitive deficits, such as impaired free recall, retrieval deficits and long-term storage [27].

Patients surviving intensive care and requiring long-term mechanical ventilation need detailed discharge planning and homecare services, as described by ESCARRABILL [28]. Only a small proportion of patients with severe COPD discuss end-of-life issues with their physicians, although their reduction in activities of daily living may be similar or worse than patients with nonsmall cell lung cancer [29]. Nevertheless, COPD patients are less likely to receive home nursing and palliative care services than patients with lung cancer, despite having similar preferences for palliation [30, 31]. Therapies that are designed to improve comfort and coping become more important than therapies aimed at removing symptoms. There is often a lack of information from professionals regarding diagnosis, prognosis and social support. Impediments to planning end-of-life care, such as not being able to predict prognosis, in the setting of a gradual decline punctuated by episodic exacerbations result in difficult decisions being deferred, so that few patients complete advance directives [32]. Decision aids can increase knowledge, realistic perceptions of benefit and harm from interventions, and can improve agreement between the patient's reported values and the option that is chosen [33].

Advance directives increase patient autonomy by their specifying treatment choices and indicating surrogate decision makers [34]. Patients educated in advance directives are more likely to be assured that the physicians understand their preferences [35] and patients with end stage chronic obstructive pulmonary disease will raise these issues if prompted to do so [36]. This important issue, and also other ethical and legal issues, will be addressed by CURTIS [37].

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