

## Editorial

# Chronic Obstructive Pulmonary Disease Mortality. SEPAR COPD-Smoking Year<sup>☆</sup>



## Mortalidad en la enfermedad pulmonar obstructiva crónica. Año SEPAR EPOC/Tabaco

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The EPI-SCAN study concluded that the prevalence of chronic obstructive pulmonary disease (COPD) in Spanish individuals aged between 40 and 80 years is 10.2%.<sup>1</sup> In 2012 in Spain, the rate of deaths due to respiratory diseases rose sharply, to become the third most common cause of death in 2013 (91.4 deaths per 100 000 inhabitants; <http://www.ine.es/prensa/np896.pdf>), and the third cause of hospital discharge (11.2%) in 2014 (<http://www.ine.es/prensa/np942.pdf>).

### Causes of Death in Chronic Obstructive Pulmonary Disease

In recent years, the prevalence of smoking has fallen in Western countries; healthcare and the economy, together with the therapeutic arsenal and living conditions of patients with COPD, have all improved. These changes have led to a fall in standardized COPD mortality rates in Europe, but the importance of COPD in the 21st century will continue to be a growing problem for different reasons, as reported by López Campos et al.<sup>2</sup> Patients with mild COPD generally die from cardiovascular diseases and lung cancer. In contrast, when the disease is more severe, the main cause of death is progression of the disease itself. Between 50% and 80% of our COPD patients die from lung disease, whether disease exacerbation (30%–50%) or lung cancer (8%–13%) or other respiratory diseases. The main causes of death in patients with severe COPD are respiratory (80.9%), cardiac (5.6%), cerebrovascular accidents (12.4%), and other causes (6.7%).

### Predictors of Mortality in Chronic Obstructive Pulmonary Disease

Predictors of mortality can be grouped as follows:

- *Signs/symptoms.* Dyspnea is the major and most debilitating symptom of COPD, and the most important clinical predictor

of mortality.<sup>3</sup> Loss of weight has been considered an independent factor for mortality. There is a clear association between a low body mass index (BMI<25 kg/m<sup>2</sup>) and higher COPD mortality.

- *Lung function.* Both diminished forced expiratory volume in 1 s (FEV<sub>1</sub>) and static hyperinflation (inspiratory fraction: inspiratory capacity/total lung capacity and residual volume/total lung capacity ratio: RV/TLC) have been associated with greater mortality. Moreover, hyperinflation predicts exercise capacity<sup>3</sup> and is measured by the 6-minute walk test (6MWT), which has been clearly correlated with mortality in COPD patients. Recently, Rim Shin et al.<sup>4</sup> confirmed that, in addition to advanced age, both raised RV/TLC and a short 6-minute walking distance are independent predictors for all-cause mortality.
- *Multidimensional indices.* Various independent variables are used to predict mortality in COPD, and these have been incorporated into multidimensional indices which can determine the patient's status.<sup>3</sup> Four easily-recorded variables, clearly predictive of the risk of mortality, were identified for the BODE index: BMI, degree of airflow obstruction, dyspnea (measured according to the Medical Research Council [MRC] scale), and exercise capacity (measured by the 6MWT). An increase in the BODE index has been shown to increase the risk of death, to the extent that in the fourth quartile (BODE index 7–10), mortality rises to 80% in 52 months. BODE is a better predictor of mortality than FEV<sub>1</sub>. BODE is even a good predictor of the risk of hospitalization due to COPD exacerbation.<sup>3</sup>
- *Other variables predictive of mortality.* COPD outcome has been shown to be clearly linked to the presence, frequency, and intensity of exacerbations, and mortality is higher in patients with more yearly exacerbations. Moreover, adding exacerbations to the BODE index improves its predictive capacity.<sup>5</sup> This led to the introduction of the multicomponent BODE index (BODEx), in which the exacerbation rate replaces the 6MWT when the latter is not available. Both BODE and BODEx have high prognostic reliability in the evaluation of severity.<sup>6</sup>

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Comorbidities are very common in COPD. In a recent study,<sup>7</sup> after adjusting for age and sex, a higher prevalence than expected was found for 10 chronic diseases: heart failure, chronic liver

disease, asthma, osteoporosis, ischemic heart disease, anxiety, depression, arrhythmias, and obesity. The Charlson index, which quantifies comorbidities, has demonstrated its utility as an independent predictor of mortality in patients hospitalized for recurrent COPD exacerbations.<sup>8</sup>

Another aspect recently linked to higher mortality is continuity of care in COPD patients: if continuity is low, all-cause mortality rises by 22%.<sup>6</sup>

Anemia has been associated with higher mortality—a linear correlation has been found between hemoglobin levels and mortality—and the associated dyspnea contributes to poorer exercise tolerance.<sup>3</sup>

### Factors Related with Improved COPD Survival

Below is a short analysis of factors known to be related with improved survival in COPD patients. It is clear beyond doubt that stopping smoking is the best strategy for avoiding disease progression, and reduces mortality by 50% compared to COPD patients who continue to smoke.<sup>9</sup> For many years now, home oxygen therapy has been accepted as a strategy which prolongs survival in patients with advanced COPD and severe hypoxemia (basal oxygen arterial pressure <55 mmHg). This scientific evidence comes from the results of 2 large controlled studies which were presented at the beginning of the 1980s: the British Medical Research Council, and the North American Nocturnal Oxygen Therapy Trial (NOTT), as indicated in the revised SEPAR guidelines (2014).<sup>10</sup> In both series, administration of home oxygen therapy for at least 15 h a day prolonged survival.

Pulmonary rehabilitation has been related with lower mortality in COPD, since it improves dyspnea and exercise capacity.<sup>3</sup> Weight gain (>8 kg/8 weeks) is also a significant predictor of survival.<sup>3</sup> Volume reduction surgery in selected patients is known to reduce the BODE index,<sup>3</sup> and non-invasive ventilation during exacerbations with respiratory failure improves survival.

To conclude, we remind our readers that we are currently in the SEPAR COPD/Smoking Year. To our knowledge, only 17% of the Spanish population is aware of the term COPD,<sup>11</sup> so we face the significant challenge of raising awareness of this respiratory disease, currently the third cause of death, and its undeniable relationship with smoking.

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