



CORRESPONDENCE

BODE index and pulmonary rehabilitation in chronic respiratory failure

To the Editors:

We read with interest the article by COTE and CELLI [1] regarding the beneficial effects induced by pulmonary rehabilitation (PR) on the BODE (body mass index (BMI), degree of airway obstruction, dyspnoea, exercise capacity) index (BI) in patients with chronic obstructive pulmonary disease (COPD).

In an observational study, COTE and CELLI [1] showed that the response to outpatient PR can be objectively measured using the BI, whose change provides information regarding ultimate survival, and that participation in a PR is associated with a decrease in the number of hospitalisations. This multidimensional 10-point scale has been previously shown to predict the death risk in COPD patients [2].

We do accept with great enthusiasm the idea that there is now a flexible and pragmatic tool for a multidimensional staging system in COPD. This disease has complex effects on other aspects of respiratory function and, in most patients, is associated with important systemic changes [3].

To the best of our knowledge, the relative value of BI in measuring the effects of PR in the latest phase of COPD (*i.e.* respiratory failure) has not been investigated. For this reason, we herein briefly report the value of BI as an indicator of the clinical outcome and quality of life (QoL) in COPD subjects with chronic respiratory failure (CRF) undergoing an in-patient PR programme (iPR) in our institution.

Following institutional review board approval, 30 subjects (12 males; 18 females; mean \pm SD age 72 ± 1.9 yrs) with CRF on long-term oxygen therapy who consecutively underwent iPR in our institution (September–October 2005) were considered, upon informed consent, eligible for evaluation and data were prospectively collected.

The iPR included the following: exercise and muscle training (upper and lower extremity endurance training, respiratory muscle training and stretch); disease education; mucus evacuation techniques; psychosocial intervention; and instruction in the use of medication and relaxation techniques. Exercise sessions were held 5 days \cdot week⁻¹ (3 h \cdot day⁻¹) for a total of 4 weeks.

All the BI outcomes, *i.e.* 6-min walking distance (6MWD), Medical Research Council (MRC) Dyspnoea Scale, forced expiratory volume in one second (FEV₁) and BMI, were assessed on admission and discharge from iPR. The St George's Respiratory Questionnaire (SGRQ) was used to measure the QoL status. The Wilcoxon rank test for nonparametric data was used.

The BI significantly improved after iPR (pre 5.0 ± 2.5 ; post 2.7 ± 1.9 ; $p < 0.001$), in particular with FEV₁ % predicted (pre 53.1 ± 26.3 ; post 55.9 ± 24.8 ; $p = 0.009$), MRC Dyspnoea Scale (pre 3.6 ± 1.1 ; post 1.9 ± 0.8 ; $p < 0.001$), 6MWD (pre 272 ± 113.7 m; post 340.6 ± 108.2 m; $p < 0.05$) and SGRQ (pre 53.3 ± 17.4 ; post 37.4 ± 19.5 ; $p < 0.001$).

The BI was negatively correlated with FEV₁ ($p < 0.001$) and 6MWD ($p < 0.001$), whereas it was positively correlated with MRC ($p < 0.001$) and SGRQ (activity, impact and total score; $p = 0.001$).

The same results were also found in subjects aged >70 yrs (mean 75.36 yrs), where the BI significantly improved after iPR (pre 5.6 ± 2.1 ; post 3.5 ± 1.5 ; $p < 0.001$).

In conclusion, even with the limitations of a small observational uncontrolled study, we can report a trend confirming that the BODE index (with its simple but robust variables) captures the beneficial effects induced by an in-patient pulmonary rehabilitation programme in severe and elderly chronic obstructive pulmonary disease subjects with chronic respiratory failure. In these subjects with worsening disability and handicap, the BODE index could be a useful indicator of the quality of life status modifications.

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- 3 Celli BR, Calverley PMA, Rennard SI, *et al.* Proposal for a multidimensional staging system for chronic obstructive pulmonary disease. *Respir Med* 2005; 99: 1546–1554.