

## Success rate during noninvasive ventilation in acute exacerbation of chronic obstructive pulmonary disease: a real-life study?

**To the Editor** Currently, noninvasive mechanical ventilation (NIV) is the gold standard therapy for acute hypercapnic exacerbation of chronic obstructive pulmonary disease (COPD); however, there is a subgroup of patients with a high risk of NIV failure that require early screening.

We have read a recent paper by Nicolini et al.,<sup>1</sup> who analyzed the key determinants related to NIV failure during long-term follow-up of a large group of patients. Their main conclusions indicate that the skills of an expert team performing NIV are extremely important, and that improvement of those skills results in an exceptionally low hospital mortality rate (5.3%) related to the treatment of acidotic acute exacerbations of COPD. Although we consider the article very interesting, there are some aspects that need to be addressed before the results are implemented in clinical practice.

First, in our opinion, the most important limitation of the study, which unfortunately was not underlined by the authors, is a high mortality rate following hospitalization. A readmission rate at 6 months was as high as 21.7%, resulting in the mortality rate of 15.2%. Considering the “real-life scenario” as stated by the authors, and the fact that COPD is a chronic disease, in which previous hospitalizations related to acute exacerbations should be considered as mortality and risk factors for next exacerbation, all patients should have been followed up in a more detailed manner. What follows, there are 2 main aspects to be considered: 1) there are no data on patient readmissions (it would be valuable to provide information on whether patients were included only once into the study); 2) there are no data on the treatment modality used after hospitalization.

Second, it is important whether there were any differences in the readmission rate and prognosis of patients discharged on pharmacological treatment only, pharmacological plus oxygen treatment, or pharmacological plus oxygen and NIV treatment. The need for these data is highlighted by a recent publication by Köhnlein et al.,<sup>2</sup> indicating that home NIV in patients with

hypercapnic COPD may reduce 1-year mortality to 12%. The discrepancy in survival between those studies should warrant a post hoc analysis of the study database.

Third, regarding NIV modalities and complications reported, the authors used various types of ventilation during the study. In our opinion, it would be important to report whether there were any differences in treatment success rates (death-to-survival ratio) between different types of ventilation: pressure support ventilation (497, 45.6%), bilevel positive airway pressure–spontaneous/timed (421, 38.6%), assisted pressure-control ventilation (89, 8.2%), and average volume assured pressure support (82, 97.6%).<sup>3</sup> As common complications, skin breakdown (56, 42.5%) reported is higher regarding long-term team experience and previous complications. This complication is related to longer NIV durations.<sup>3</sup>

Finally, although the causes of acute exacerbations of COPD were listed in the inclusion criteria, it would be interesting to know whether the authors collected data on 2 more aspects that might have affected mortality rates in COPD: a) domiciliary oxygen therapy (because it is strongly associated with disease-related prognosis) and b) associated comorbidities such as the rates of cancer and cancer-related death as well as risk factors related to heart failure, pneumonia, depression, and cachexia (to examine whether those factors also could be responsible for reported mortality).<sup>4,5</sup>

In conclusion, in our opinion, it should be emphasized that although NIV is considered a gold standard in acute exacerbation of COPD, it has a learning curve, which should be taken into account when choosing a treatment modality. Despite challenging methodology and logistic difficulties of the study, COPD patients should be assessed in a more holistic and comprehensive way.

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**Conflict of interest** The author declare no conflict of interest.

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**Authors' reply** We would like to thank Skoczynski and Esquinas<sup>1</sup> for their interesting letter and, in particular, for the suggested title: "Success rate during noninvasive ventilation in acute exacerbation of chronic obstructive pulmonary disease: an outlook on real-life study". We appreciate their comments but we highlighted in the paper that our study evaluated only hospital outcomes (and it is an important limitation as is the lack of data on the type and number of comorbidities). In our study, we did not focus on the type of a treatment modality used after hospitalization. Regarding the modalities of ventilation, we would like to add a simple clarification: bilevel positive airway pressure–spontaneous/timed was administered using Philips Respironics Vision and V60 ventilators, while pressure support ventilation, using the other ventilators cited in our study.<sup>2</sup> Moreover, pressure-controlled and, more recently, average volume assured pressure support ventilation were used in patients with a more severe disease (a higher score on the Kelly scale and/or hypercapnic encephalopathy) and/or in patients with a high body mass index.<sup>3,4</sup> As for complications, we agree with Skoczynski and Esquinas<sup>1</sup>: in more severe cases, the duration of noninvasive ventilation (NIV) is longer and the possibility of skin breakdowns is higher.

Finally, in the acute care setting, NIV should allow to overcome chronic obstructive pulmonary disease (COPD) exacerbation and reduce admissions to the intensive care unit.<sup>5</sup> We agree that COPD is a complex disease that should be assessed in a holistic and comprehensive way.

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