



Published in final edited form as:

Crit Care Med. 2015 November ; 43(11): e531–e532. doi:10.1097/CCM.0000000000001243.

Response letter to “Failure of noninvasive mechanical ventilation in acute exacerbations of COPD: need to identify borderline patients

Mihaela S Stefan, MD,

Baystate medical Center, General Internal Medicine, 759 Chestnut Street, Springfield, MA 01199, 5165813013, mihaela.stefan@baystatehealth.org

Brian H Nathanson, PhD, and

OptiStatim LLC, Longmeadow, MA

Peter K Lindenauer, MD, MSc

Center for Quality of Care Research, Baystate Medical Center, Springfield, MA

Keywords

Noninvasive ventilation failure COPD

We thank Dr. Hoo and Dr. Esquinas (1) for their insightful commentary on the importance of better identifying “borderline patients” who are at high risk of noninvasive ventilation (NIV) failure. An accurate, well validated scoring system for NIV failure would help determine which patients can be safely managed outside the intensive care unit (ICU) and could help identify patients who would be poor choices for initial NIV therapy. Currently, it is an open question where patients receiving NIV should best be treated. Recommendations from the medical literature range from having all patients initiated on NIV be transferred to an ICU to stating that many patients can be safely managed on a general ward.(2)

The study we recently published was a retrospective analysis of critically ill patients with an acute exacerbation of COPD ventilated with noninvasive (NIV) or invasive (IMV) mechanical ventilation. Like our study, several other retrospective studies observed that patients with NIV failure have worse outcomes than patients treated with IMV, prompting the conclusion that delayed intubation may be the main reason for an increased risk in mortality.(3,4) However, the results from these studies must be interpreted carefully. Patients treated with NIV who required intubation had greater acuity (higher Simplified Acuity Physiology Score, SAPS II 46 vs 32) and had worse outcomes than those who avoided intubation (ICU mortality 13.1% vs 3.1%). Patients who failed NIV had median SAPS II scores which were similar to patients initially intubated (46 vs 44). However, the

Copyright form disclosures: Drs. Stefan and Lindenauer received support for article research from the National Institutes of Health. Dr. Nathanson disclosed that his company, OptiStatim, LLC, is a consulting firm for the health care industry and for academic institutions doing medical research (No clients had research related to this project during the 36 months prior to submission) and disclosed that other than being paid a consulting fee for statistical assistance with this project, he personally and his company have no conflicts of interest to report. He disclosed that Baystate Medical Center has a current contract with his company, OptiStatim, LLC, for data analysis and statistical assistance with various manuscripts that are part of their academic research.

IMV treated group in our study included a heterogeneous patient population with a wide spectrum of acute respiratory failure (SAPS II Interquartile range 32-58). It is quite possible that some of these patients would have survived with NIV only. This may explain why patients with NIV failure have worse outcomes in observational studies—namely NIV failure patients are being compared to all IMV patients including those with moderate acuity who were eligible for NIV. In contrast with our findings, in a randomized controlled study of NIV versus IMV in patients with acute respiratory failure, Honrubia et al found that mortality in patients in whom NIV failed was equal to that of patients receiving IMV from the start. This suggests that in similar patient population, once strict criteria of NIV failure are implemented, intubation is not dangerously delayed.(5)

Thus, we agree with Dr. Hoo and Dr. Esquinas that only prospective clinical trials can accurately identify patients at risk for failure and share their concerns on the adverse prognosis associated with NIV failure. Non-invasive ventilation has great potential for select patients with acute respiratory failure. The critical care community's challenge is to identify the patients where NIV is the most appropriate treatment.

References

1. Soo Hoo HW, Esquinas AM. Failure of Noninvasive ventilation (NIV) in Acute Exacerbations of COPD: Need to identify borderline patients. *Crit Care Med*. 2015 in press.
2. Hill NS. Where should noninvasive ventilation be delivered? *Respir Care*. 2009; 54(1):62–70. [PubMed: 19111107]
3. Stefan MS, Nathanson BH, Higgins TL, et al. Comparative Effectiveness of Noninvasive and Invasive Ventilation in Critically Ill Patients With Acute Exacerbation of Chronic Obstructive Pulmonary Disease. *Crit Care Med*. 2015; 43(7):1386–1394. [PubMed: 25768682]
4. Chandra D, Stamm JA, Taylor B, et al. Outcomes of noninvasive ventilation for acute exacerbations of chronic obstructive pulmonary disease in the United States, 1998-2008. *Am J Respir Crit Care Med*. 2011; 185(2):152–159. [PubMed: 22016446]
5. Honrubia T, Garcia Lopez FJ, Franco N, et al. Noninvasive vs conventional mechanical ventilation in acute respiratory failure: a multicenter, randomized controlled trial. *Chest*. 2005; 128(6):3916–3924. [PubMed: 16354864]