Letters

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Noninvasive Mechanical Ventilation for Prevention of Post-Extubation Respiratory Failure

In their prospective multicenter randomized controlled trial, Su et al report that noninvasive mechanical ventilation (NIV) used in all patients after extubation did not reduce re-intubation rate, when compared to standard oxygen therapy.[1] Nevertheless, we believe that the concept of "preventive" NIV requires not only early application of NIV but also careful selection of patients who are high risk for extubation failure and needing re-intubation.

Some aspects of this study need mention, as these could have influenced the results:

- Selection of the study patients was based only on few validated risk factors,[2] like severely hypercapnic COPD,[2,3] high Acute Physiology and Chronic Health Evaluation II score, and persistent weaning failure.[3]
- The duration of invasive mechanical ventilation prior to extubation is unknown.[4]
- In the post-extubation period there was no information on short-term outcome and re-intubation related complications like ventilator-associated pneumonia.[4]

Early NIV discontinuation could have reduced stability in patients with muscular fatigue, such as in COPD.[2,3] Additionally, airway clearance is not taken into account in patients with bronchial hypersecretion, which is a known risk factor for post-extubation respiratory failure.[5]

To study the use of NIV as a preventive approach in patients at low risk for post-extubation respiratory failure may be futile, and studies should be targeted to high-risk patients.

Antonio M Esquinas Rodriguez MD PhD
Intensive Care Unit
Hospital Morales Meseguer
Murcia, Spain

Nicolino Ambrosino MD
Pulmonary and Respiratory
Intensive Care Unit
Cardio-Thoracic Department
University Hospital Pisa
Pisa, Italy

Egbert Pravinkumar MD FRCP EDIC
Department of Critical Care
MD Anderson Cancer Center
Houston, Texas

The authors have disclosed no conflicts of interest.

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The authors reply

We appreciate the interest of Dr Rodriguez and colleagues in our study.[1] We agree that for "preventive" NIV to be most effective, selection of appropriate patients (eg, those who are at high risk for extubation failure) would be important. In fact, in the discussion we cautioned the readers about generalizing our findings to all patients by emphasizing the enrollment of a mixed population in our study. The durations of mechanical ventilation before enrollment into the study were 7.2 ± 4.7 days for the NIV group and 6.7 ± 4.3 days for the control group. These were similar to those in the studies of Ferrer et al.[2,3] The primary end points for our study were the re-intubation rate and ICU mortality. We did not follow the complications of patients who required re-intubation, such as ventilator-associated pneumonia. Patients in the NIV group were monitored for respiratory distress after the first 12 hours. NIV was discontinued if patients were stable or reinstated if patients developed respiratory distress. Therefore we believe our patients in the NIV group were adequately supported by NIV after extubation.

We also agree that bronchial secretions could be a major cause of extubation failure, as shown in our result that approximately 25% of patients who failed extubation were felt to have excessive secretions. Finally, our study was initiated in 2002, at which time there were important questions on how best to use NIV at the juncture of extubation. Since then, several studies have identified high-risk patients who may benefit most from early use of NIV in the post hoc analysis, but few have been validated prospectively.[4] In addition, in certain patients who were considered high-risk for extubation failure (eg, those who repeatedly failed spontaneous breathing trials in the study by Ferrer et al[2]), extubation to NIV was simply impractical in clinical practice. Our study used a protocol closely following extubation practice to address the question of whether or not NIV should be used routinely in all patients after extubation.[1] According to this largest trial to date, the answer is emphatically "no."

Chin-Pyng Wu MD PhD
Department of Thoracic Internal Medicine
Landseed Hospital
Ping-Jen City, Taiwan

Chien-Ling Su MSc
Ling-Ling Chiang MSc
School of Respiratory Therapy
Taipei Medical University
Taipei, Taiwan

Yuh-Chin T Huang MD MHS
Department of Medicine
Duke University Medical Center
Durham, North Carolina

The authors have disclosed no conflicts of interest.

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DOI: 10.4187/respcare.01969

Notice of Retraction

At the request of the author, "Comparing performance of 3 oscillating positive expiratory pressure devices at similar amplitude and frequencies of oscillations on displacement of mucus inside trachea during cough" has been withdrawn. The paper has not been published in print, but was published electronically ahead of print on March 13, 2012. DOI: 10.4187/respcare.01631.

DOI: 10.4187/respcare.02033