

Should Noninvasive Ventilation Be Used in End-Stage Chronic Respiratory Failure to Reverse Hypercapnic Coma?

In this issue of *RESPIRATORY CARE*, Lemyze and colleagues¹ conducted a prospective, observational, case–control study of the use of noninvasive ventilation (NIV) in 43 subjects who were classified as do not intubate (DNI) and were experiencing hypercapnic coma resulting from end-stage chronic respiratory failure. This group was compared to a cohort of 43 frail subjects with end-stage hypercapnic respiratory failure but without hypercapnic coma. The investigators found that NIV was usually successful in both groups in reversing hypercapnia and more than half survived > 6 months after the acute event. Also, upon being surveyed, most surviving subjects said they would choose to be placed on NIV if a new episode of acute hypercapnic respiratory failure occurred.

This study highlights a topic that is controversial. The use of NIV in patients with chronic irreversible respiratory disease who experience an acute event has gained some support, but there remain clinicians who will not prescribe it. These clinicians argue that NIV adds to patients' discomfort and that it delays the dying process.² This reasoning would be valid if this strategy were applied to a heterogeneous population. However, it has been shown that patients with acute on chronic respiratory failure (especially COPD) who receive NIV may have a decent chance of surviving an acute hypercarbic event.³ In this patient population, there is some component of reversibility in which NIV will be beneficial. However, it is difficult to assess reversibility without an NIV trial. The study by Lemyze and colleagues¹ adds to this body of evidence and suggests that at least a trial of NIV is warranted in the patient population experiencing an acute event.

The pH levels in Lemyze's study ranged from 7.06 to 7.21 (mean 7.15) in the hypercapnic coma group. A pH level < 7.25 has been previously reported to be an important prognostic indicator.⁴ However, recent work by Steriade et al⁵ did not identify a connection for mortality between a pH level < 7.15 and NIV. Guidelines from the

British Thoracic Society/Intensive Care Society state that severe acidosis should not preclude a trial of NIV for an exacerbation of COPD.⁶ From this literature, it's fair to say that patients with COPD who are suffering from an acute event that results in hypercapnic coma should be offered a trial of NIV. However, clear end points in the event of NIV failure must be established with caregivers and family members in terms of what will constitute NIV failure (eg, lack of coma reversal in a specified length of time) and specifically what will be done once the NIV is discontinued.

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In summary, patients with chronic irreversible respiratory failure experiencing an acute respiratory failure event should be offered a trial of NIV. If the NIV proves to be successful, these patients may return to their baseline functionality level and continue their lives. However, clear end points must be established in the event of NIV failure so as not to unduly delay the dying process.

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