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Lung alert

Non-invasive ventilation (NIV) immediately after extubation reduces ventilatory failure and 90-day mortality in patients with hypercapnia

This randomised open controlled trial took place from 2005–7 in three Spanish intensive care units. The aim was to assess whether non-invasive ventilation (NIV) would prevent respiratory failure and hence re-intubation, an independent risk factor for mortality, nosocomial pneumonia and length of hospital stay in patients who developed hypercapnia (arterial carbon dioxide tension >45 mm Hg) during a spontaneous breathing trial prior to extubation. The secondary end point was 90-day mortality.

One hundred and sixty-four consecutive patients were registered and 106 underwent randomisation. Fifty-four were assigned NIV (mean pressure 17/4 cm H₂O) immediately after extubation for a maximum of 24 h while the control group was given oxygen alone. Both groups were monitored for ventilatory failure and, if found, were either managed with re-intubation or rescue NIV according to predefined criteria.

Statistically significant differences in the development of respiratory failure were found in the NIV group compared with the controls (15% vs 48%), the impact occurring within the first 24 h. There was, however, no difference in the rate of re-intubation or in the length of stay in hospital or in the intensive care unit (ICU). This may have been a result of rescue NIV being deployed in both groups; 20/25 controls in respiratory failure met the criteria for rescue NIV, leading to 75% avoiding re-intubation, a better outcome than in previous reports.

Although overall mortality in the ICU and hospital did not differ, 90-day mortality was significantly reduced in the NIV group, suggesting longer term benefits of NIV which cannot be explained by re-intubation avoidance alone and warrants further assessment.

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