

Mechanical Ventilation: Post-extubation Respiratory Support



A new study, published in *Annals of Intensive Care*, suggests that high-flow nasal cannula (HFNC) may be a powerful respiratory support in the post-extubation period with multiple physiologic and clinical benefits. The randomised controlled trial compared HFNC versus low-flow oxygen supplied through nasal prongs or facial mask for 24 hours after extubation as respiratory supports in patients at high risk of extubation failure.

Decreasing the duration of invasive mechanical ventilation by early safe extubation is a major clinical goal in intensive care unit (ICU). Prolonged intubation increases the risk of ventilator-induced lung injury, ventilator-induced diaphragm dysfunction, myopathy and infections. Nonetheless, patient management in the post-extubation period can be challenging and every effort should be made to avoid re-intubation, which is associated with significantly increased morbidity and mortality.

However, an editorial appearing in the same issue of the journal cautions that use of HFNC should be limited to patients at risk of re-intubation. The trial, conducted by Dr. Fernandez and colleagues, has important limitations. In that study, HFNC was arbitrarily implemented for 24 hours only, while in everyday clinical practice, its discontinuation would more likely be based on the patient's clinical evolution, the editorial points out. In addition, no physiologic test was performed to guide randomisation (i.e., predictive enrichment: HFNC could have been implemented only in patients who have decreased respiratory rate after 30 minutes of treatment).

"Despite these limitations, we must recognise that study findings on the role of HFNC in the post-extubation period are relevant and encouraging: Incidence of respiratory failure reflected the hypothesised reduction granted by HFNC and re-intubation somehow decreased, too. Mortality and length of stay were low and similar in both groups," write authors Tommaso Mauri, MD; Giacomo Grasselli, MD (both from University of Milan in Italy); and Samir Jaber, MD (University Teaching Hospital of Montpellier in France) in the editorial.

The physiologic effects of HFNC might perfectly match the patient need during the post-extubation period, the editorial continues. HFNC generates a "positive end-expiratory pressure (PEEP) effect" that might increase end-expiratory transpulmonary pressure stabilising the alveoli, increase alveolar pressure decreasing the hydrostatic capillary-alveolar gradient and increase the airways calibre. In this way, driving transpulmonary pressure decreases, preventing further injury, and work of breathing is reduced, preventing fatigue.

The editorial also notes that heated humidified gas delivered by HFNC can promote secretion fluidity and clearance. "These data suggest that HFNC could effectively contribute to interrupt the post-extubation vicious circle of oedema, excessive effort, lung injury and muscle fatigue, facilitating full recovery of lung function," write Drs. Mauri, Grasselli and Jaber.

Source: [Annals of Intensive Care](#)

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