Non-invasive ventilation as a weaning or rescue technique may cut risks in some patients

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Noninvasive ventilation (NIV) used as a weaning technique for mechanically ventilated patients can shorten intubation time and may reduce the risk of post-extubation acute respiratory failure (ARF), according to French researchers. They also found that NIV used as a post-intubation rescue therapy could significantly reduce the risk of reintubation and death.

"While NIV used as a weaning technique did not reduce the risk of reintubation as compared with conventional weaning and standard oxygen therapy, we do think the reduced risk of reintubation or death with NIV used as rescue therapy bears further investigation," said lead investigator Christophe Girault, MD.

The study was published online ahead of the print edition of the American Thoracic Society's American Journal of Respiratory and Critical Care Medicine.

Researchers consecutively recruited patients with chronic hypercapnic respiratory failure (CHRF) from 13 French and Tunisian ICUs between January 2002 and March 2006. Eligible patients had to have been intubated for at least 48 hours and failed a spontaneous breathing trial (SBT). Nearly one-third of 388 ventilated patients passed the SBT and were able to breathe on their own. Of the remaining patients, 208 failed the spontaneous breathing trial and were randomized to one of three

ventilation-weaning strategies: "conventional weaning," where patients remained intubated and underwent one or more daily SBT with T-piece or pressure support ventilation (PSV) with or without positive end expiratory pressure (PEEP), and a progressive decrease in PSV level (until ? 7 cmH2O); extubation followed by standard oxygen therapy—administered via a nasal cannula or venturi mask; or extubation followed by NIV administered through a facial mask. This was the first randomized, controlled study of its sort in CHRF patients.

The primary endpoint evaluated was the need for reintubation within seven days of extubation. The secondary endpoints were secondary occurrence of ARF or death from all causes within seven days of extubation. The researchers also evaluated time to rescue post-extubation NIV and the probability of reintubation or death within seven days following its initiation; ICU and hospital length of stay and survival; and respiratory condition on hospital discharge.

They found that the probability of reintubation was not significantly different between the three weaning strategies, and that the causes of reintubation were similar between groups. However, post-intubation ARF in the NIV group was significantly lower than in others.

"Our results suggest that rescue NIV might be useful to avoid reintubation when post-extubation ARF occurs in these patients," said Dr. Girault.

These results are consistent with previously published results, including those of the VENISE trial, which involved a large cohort of CHRF patients considered to be potentially difficult-to-wean.

"NIV allowed to decrease the intubation duration as compared to invasive weaning, without increasing the risk of weaning failure in terms of reintubation," he continued. "NIV might, in fact, allow earlier

extubation but not necessarily more rapidly 'de-ventilation' in difficult-to-wean CHRF patients."

Importantly, the study also points to a possible benefit of NIV as a rescue therapy to avoid reintubation. "Indeed, it was applied frequently in the two non-NIV groups and reduced the risk of reintubation or death by 45 percent in patients assigned to invasive weaning and 58 percent in those assigned to the oxygen therapy group," said Dr. Girault.

"Rescue NIV is currently not recommended for non-selected medical patients because until now there has been no proven benefit and even potential harmful outcome," he continued. "However, this study suggests that the standard should perhaps be re-evaluated in light of this, and further research, if the result proves consistent."

Further research should be done, he continued. For next steps, Dr. Girault would like to see a randomized, controlled trial with NIV as a weaning technique but with post-extubation ARF occurrence as the primary endpoint, and another randomized, controlled trial to confirm the potential benefit of NIV used as rescue therapy in this specific population.

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