

RESEARCH NEWS

Is reconnection to mechanical ventilation for one hour after a successful spontaneous breathing trial recommended in order to reduce reintubation rate in critically ill patients?

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Keywords - mechanical ventilation, spontaneous breathing trial, rest, post-extubation respiratory failure

Article

Reconnection to mechanical ventilation for 1h after a successful spontaneous breathing trial reduces reintubation in critically ill patients: a multicentre randomized controlled trial. Published in Intensive Care Medicine, November 2017.^[1]

Why was this research done?

Spontaneous breathing trials (SBT) are used to identify extubation readiness. Still, extubation failure and the need for reintubation after a successful SBT remain common and is associated with higher mortality.^[2] Optimal technique and duration of a SBT are subject of debate. However, circumstantial evidence indicates that a period of ventilator reconnection after a SBT may reduce extubation failure.^[3,4]

What was the research question?

To determine whether one hour of rest after a successful SBT would reduce post-extubation respiratory failure and reintubation rate. Primary outcome was reintubation within 48 hours of extubation. Secondary objectives included ICU mortality, hospital mortality, ICU length-of-stay and hospital length-of-stay.

How was this investigated?

The study was a multicentre randomised controlled trial conducted in Spain. Adult patients receiving invasive mechanical ventilation for at least 12 hours were randomised after successfully completing a SBT to be either extubated directly (control group) or reconnected to the ventilator for a one hour's rest before extubation (rest group). The SBT was performed according to local clinical protocols and the technique and duration varied among centres. Reintubation or use of noninvasive ventilation (NIV) after extubation remained at the discretion of the physicians. Patients were followed up until hospital discharge or death.

Main findings

In total, 470 patients were randomised. Reintubation within 48 hours after extubation was more common in the control group than in the rest group (14% vs. 5%; $p < 0.001$). Variables associated with reintubation were rest (OR 0.34; $p = 0.002$), APACHE II (OR 1.04; $p = 0.04$), and days of mechanical ventilation before the SBT

(OR 1.04; $p = 0.04$). Post-extubation failure was more common in the control group than in the rest group (24% vs. 10%; $p < 0.001$). Rescue NIV was applied more often in the control group than in the rest group (14% vs. 5%; $p = 0.71$).

No differences in median duration of ICU stay (10 [5-19] days vs. 11 [6-18] days; $p = 0.30$) or hospital stay (23 [14-38] days vs. 26 [17-43] days; $p = 0.93$) were found between the control group and rest group. ICU mortality (4.5% vs. 4.8%; $p = 0.87$) and hospital mortality (8.2% vs. 10.1%; $p = 0.52$) were also not different between the control group and the rest group.^[5]

After concluding the study, it was realised that the sample size had been miscalculated; this should have been 1372 patients.

Conclusion and consequences for daily practice

The authors conclude that one hour of rest after a successful SBT prevents reintubation and extubation failure within 48 hours after extubation. The strengths of the study include the multicentre design and pragmatic approach to weaning techniques. The limitations include that the study was underpowered, even for the primary endpoint, absence of a reasonable physiological explanation for the improved outcome in the rest group, and frequent use of NIV in extubation failure. Given the limitations of this study we do not recommend to routinely reconnect patients to the ventilator 'for rest' after a successful SBT.

Disclosures

The authors declare no conflict of interest. No funding or financial support was received.

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