ICU
MANAGEMENT & PRACTICE

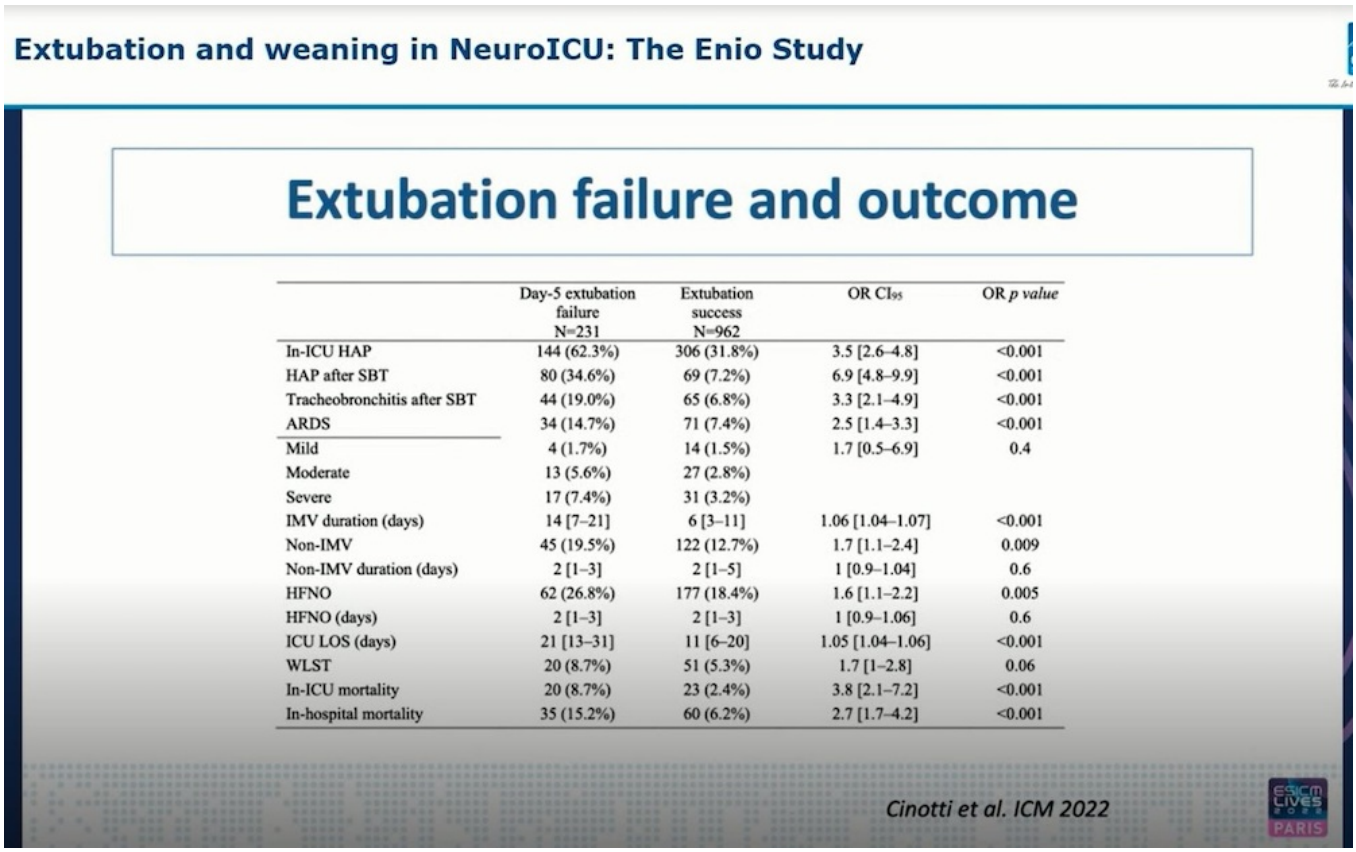
#LIVES2022: Extubation Strategies in Neuro-Intensive Care Unit Patients

Findings from the Extubation strategies and in Neuro-Intensive care unit patients and associations with Outcomes (ENIO) study were presented this week at ESICM LIVES 2022.

Invasive mechanical ventilation is a primary intervention in critically ill patients. Timely weaning reduces the risk of hospital-acquired pneumonia, chronic illness and cost of care. In particular, neurocritical care is a high-risk population group that often receives prolonged invasive mechanical ventilation. However, there is very little information about the liberation strategies of invasive mechanical ventilation for this group. Neurocritical patients are poorly represented in clinical trials, and it is thus unclear which factors contribute to extubation success or which patients would benefit from direct tracheostomy. Hence, there is a lack of evidence-based guidelines for extubation and tracheostomy in neurocritical care patients.

ENIO, an international, prospective observational study, included 73 ICUs in 18 countries. One thousand five hundred twelve neurocritical care patients with a Glasgow Coma Score ≤ 12 and who had received invasive mechanical ventilation ≥ 24 h and had undergone extubation attempt or tracheostomy were included in the study. The primary endpoint was extubation failure by day 5. Two-thirds of the study patients were randomly allocated to the training cohort and one-third to the validation cohort. Secondary endpoints of the study included the duration of invasive mechanical ventilation and in-ICU mortality.

Findings show that among the 78.9% of patients who underwent an extubation attempt, 19.4% were recorded as failures. Patients with extubation failure had a longer duration of invasive mechanical ventilation and a higher in-ICU mortality rate. 21.1% of patients underwent tracheostomy without extubation attempt. Patients with direct tracheostomy had a longer duration of invasive mechanical ventilation and higher in-ICU mortality than patients with an extubation attempt (success and failure).



	Day-5 extubation failure N=231	Extubation success N=962	OR CI95	OR *p value*
In-ICU HAP	144 (62.3%)	306 (31.8%)	3.5 [2.6–4.8]	<0.001
HAP after SBT	80 (34.6%)	69 (7.2%)	6.9 [4.8–9.9]	<0.001
Tracheobronchitis after SBT	44 (19.0%)	65 (6.8%)	3.3 [2.1–4.9]	<0.001
ARDS	34 (14.7%)	71 (7.4%)	2.5 [1.4–3.3]	<0.001
Mild	4 (1.7%)	14 (1.5%)	1.7 [0.5–6.9]	0.4
Moderate	13 (5.6%)	27 (2.8%)		
Severe	17 (7.4%)	31 (3.2%)		
IMV duration (days)	14 [7–21]	6 [3–11]	1.06 [1.04–1.07]	<0.001
Non-IMV	45 (19.5%)	122 (12.7%)	1.7 [1.1–2.4]	0.009
Non-IMV duration (days)	2 [1–3]	2 [1–5]	1 [0.9–1.04]	0.6
HFNO	62 (26.8%)	177 (18.4%)	1.6 [1.1–2.2]	0.005
HFNO (days)	2 [1–3]	2 [1–3]	1 [0.9–1.06]	0.6
ICU LOS (days)	21 [13–31]	11 [6–20]	1.05 [1.04–1.06]	<0.001
WLST	20 (8.7%)	51 (5.3%)	1.7 [1–2.8]	0.06
In-ICU mortality	20 (8.7%)	23 (2.4%)	3.8 [2.1–7.2]	<0.001
In-hospital mortality	35 (15.2%)	60 (6.2%)	2.7 [1.7–4.2]	<0.001

These findings show that extubation failure is high in neurocritical care patients and is associated with unfavourable outcomes. Neurocritical care patients display an extubation failure rate of 19%, and direct tracheostomy is used as the primary liberation strategy of invasive mechanical ventilation in 21% of patients.

The take-home message from these findings is that there is a need to improve the management of neurocritical patients undergoing invasive mechanical ventilation, and innovative approaches must be developed to improve outcomes in this patient population.

Source: Intensive Care Medicine; ESICM LIVES 2022
Image Credit: ESICM

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