

Safe Liberation During Weaning from VV-ECMO



The use of venovenous extracorporeal membrane oxygenation (VV-ECMO) in patients with severe acute respiratory distress syndrome (ARDS) has increased substantially over the last few years. However, conclusive evidence supporting its use is still lacking, and mortality of patients treated with VV-ECMO for ARDS is still high.

Optimal strategies of mechanical ventilation (MV) during VV-ECMO have been reported, but there is very little detail regarding protocols for weaning from VV-ECMO. In most cases, VV-ECMO is weaned before MV and patients are assessed for readiness to be liberated with a sweep gas off trial (SGOT). Nevertheless, how to determine the timing and duration of the SGOT still remains unclear.

In this review, researchers aimed to identify clinical and MV parameters measured during SGOT that could ensure and predict safe liberation from VV-ECMO. The goal was to determine if safe liberation from VV-ECMO could be predicted at the bedside.

Two observational studies of adults weaned from VV-ECMO for severe ARDS were conducted. Researchers analysed MV settings, respiratory mechanics and clinical variables to predict safe liberation from VV-ECMO. Safe liberation was defined as the avoidance of ECMO recannulation, need for increased MV support or rescue therapy or haemodynamic instability developed within 48 hours after decannulation.

Findings from both studies show that a significant proportion of patients with severe ARDS liberated from VV-ECMO required an unplanned escalation of MV settings and haemodynamic support. Tidal volume per predicted body weight and heart rate recorded at the end of the SGOT were independently associated with higher odds of unsafe liberation from VV-ECMO. Higher inspiratory effort was also associated with unsafe liberation. Both the duration of mechanical ventilation and ICU and hospital length of stay were worse for patients deemed unsafely liberated from VV-ECMO.

Overall, these results demonstrate that patients with higher tidal volume, heart rate, ventilatory ratio and oesophageal pressure swings during SGOT were less likely to achieve safe liberation from VV-ECMO. Successful weaning from VV-ECMO during the recovery phase of ARDS is related more to ventilation than oxygenation. Ventilatory ratio may be a useful predictor of unsafe liberation from VV-ECMO. In patients with ARDS, a ventilatory ratio ≥ 2 was associated with an increased risk of worse outcomes, including mortality.

When clinicians deem a patient fit to be weaned from VV-ECMO, SGOT should be initiated. However, oxygen saturation should be monitored, and sweep-gas flow turned back on if it drops $<90\%$. Even if oxygen saturation is maintained, tidal volume per predicted body weight, heart rate, ventilatory ratio and inspiratory effort should be closely monitored.

Source: [CHEST](#)

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