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Venovenous extracorporeal membrane oxygenation for acute lung failure in adults

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Background: Acute lung failure (ALF) is an increasing problem that can be treated with venovenous extracorporeal membrane oxygenation (vv-ECMO). This report summarizes prospectively collected data of an institutional experience with vv-ECMO.

Methods: From January 2007 to December 2010, 176 patients (mean age, 48 ± 16 ; range, 14-78 years) with ALF refractory to conventional therapy were supported with vv-ECMO. The general indication for vv-ECMO was a partial oxygen pressure/fraction of inspired oxygen (F_{iO_2}) < 80 mm Hg under a F_{iO_2} of 1.0, a positive end-expiratory pressure of 18 cm H₂O, and refractory respiratory acidosis ($pH < 7.25$), despite optimization of conservative therapy.

Results: All patients underwent peripheral cannulation. In 59 cases, vv-ECMO was placed in another facility with ECMO transport by helicopter or ambulance. The mean vv-ECMO support interval was 12 ± 9.0 days (range, 1-67 days). During ECMO, 12 patients (7%) could be extubated and stepwise mobilized. Cannula-related complications during long-term support occurred in 14%, which was mostly minor bleeding. Overall survival was 56%: 58 patients (33%) died during mechanical support, and 20 (11%) died after weaning from the system. The best outcome was noted in trauma patients. Risk factors were mainly advanced age and multiorgan failure.

Conclusions: Modern vv-ECMO is an excellent treatment in patients with severe ALF and should be more liberally used.