Can ECCO₂R be the rising sun for respiratory failure?

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Background

Extracorporeal carbon dioxide removal (ECCO₂R) devices have been proposed as an adjunctive therapy in AECOPD patients to simplify withdrawal of NIV, avoid intubation or for facilitating weaning from mechanical ventilation. In ARDS patients, ECCO₂R was designed to allow ultra-protective ventilation which is proven to reduce mortality(1-3).

We investigated if adding AV-ECCO₂R in these groups was feasible, its effect on mortality and the frequency of the complications encountered.

Results

	AECOPD	ARDS
N patients	24	35
M/F ratio	12/12	16/19
Mean age	64 (63-65)	57 (54-59)
Mean APACHE	24 (21-27)	25 (23-27)
Duration of ventilation during ECCO₂R	2.4 (1.8-3.0)	5.7 (5.1-6.3)
ICU stay	10.8 (9.2-12.4)	23.9 (20.9-26.8)
Hospital stay	23.2 (19.9-26.5)	44.1 (37.5-50.9)
n patients with complications	5	7
n patients with CI for ECMO	12	18
mortality	40,9%	48,6%

Table 1: patient characteristics

Figure 3: total number and types of complications

Conclusions

(AV)-ECCO₂R is a efficient treatment for treating respiratory acidosis. However, evidence for a mortality benefit with (AV)-ECCO₂R is lacking and adequately powered randomized controlled trials are required to better elucidate risk-benefit balance.

The complications of iLA therapy encountered in this study had no significant impact on outcome in both groups.

Methods

In this retrospective observational cohort analysis 59 patients with AECOPD or ARDS were treated with (AV)-ECCO₂R therapy using a Novalung® iLA Membrane Ventilator (Xenios, Heilbronn, Germany). ICU and hospital stay, complications and CI for VV-ECMO were recorded. Arterial pH, PaO₂, PCO₂, FiO₂, serum lactate, platelet count, hemoglobin concentration and ventilatory parameters were recorded on a daily basis and at the start and termination of the ECCO₂R therapy.

Figure 1: PaCO₂ during therapy

Figure 2: pH during therapy

References:

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