

TOTAL EXTRACORPOREAL ARTERIOVENOUS CARBON DIOXIDE REMOVAL IN ACUTE RESPIRATORY FAILURE: A PHASE I CLINICAL STUDY

CONRAD SA, ZWISCHENBERGER JB, GRIER LR, ALPARD SK, BIDANI A.
INTENSIVE CARE MED 2001;27(8):1340-51

CE1-09

Objective

Evaluate the safety and efficacy of extracorporeal CO₂ removal.

Study Design

Phase I within group series trial, 2 centers.

Study Population

8 patients with acute hypercapnic respiratory failure or hypoxemic respiratory failure managed with permissive hypercapnia.

Methods

Sequential measurement of ABG, hemodynamics, ventilator settings, laboratory values, complications.

Results

PaCO₂ decreased within 2 hours from 90.8 to 51.8 mmHg despite decreased minute ventilation (6.92 to 3.00 l/min). pH normalized from 7.19 to 7.37. These improvements persisted during the full period of gas exchange support. Hemodynamics were not significantly altered throughout the procedure. Apnea trials in four patients allowed PaCO₂ values from 57–85 mmHg.

Commentary

This clinical phase I trial shows that pumpless extracorporeal CO₂ removal is capable of complete CO₂ removal during acute respiratory failure. In conjunction with protective (i.e. reduced) mechanical ventilation PaCO₂ and pH could be normalized rapidly and maintained normal throughout the treatment period.

