

PERCUTANEOUS EXTRACORPOREAL ARTERIOVENOUS CARBON DIOXIDE REMOVAL IMPROVES SURVIVAL IN RESPIRATORY DISTRESS SYNDROME: A PROSPECTIVE RANDOMIZED OUTCOMES STUDY IN ADULT SHEEP

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Objective

Evaluate outcome of extracorporeal CO₂ removal compared with mechanical ventilation only.

Study Design

Randomized prospective experimental outcome study comparing extracorporeal CO₂ removal (n = 9) with sham (n = 9).

Study Population

18 adult sheep.

Methods

Smoke inhalation injury (LD 50) plus 40% 3rd degree burn.

Measurement of ABG, CO₂ removal performance, PaO₂/FiO₂ ratio, mechanical ventilation settings, outcomes.

Results

All 8 animals undergoing extracorporeal CO₂ removal survived, while significant reduction of mechanical ventilation allowed lung protection. Only 3 out of 8 animals in the sham group survived 7 days after randomization. Extracorporeal CO₂ removal amounted to 92 to 116 ml/min (93-97 % of CO₂ production) at shunt flows of 11–14 % of cardiac output while increasing ventilator free days to 3.9 versus 0.2 in sham animals.

Commentary

Substantial outcome improvement and significantly more ventilator free days with extracorporeal CO₂ removal give valuable information on the potential of this method in smoke inhalation/burn injury patients.

