

FEMORAL ARTERIOVENOUS EXTRACORPOREAL CARBON DIOXIDE ELIMINATION USING LOW BLOOD FLOW

YOUNG JD, DORRINGTON KL, BLAKE GJ, RYDER WA.
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Objective

To test if hemofiltration equipment can be combined with a high-performance extracorporeal lung to achieve high rates of CO₂ removal at blood flow rates (< 600 ml/min).

Study Design

Prospective experimental animal study.

Study Population

Nine healthy sheep.

Methods

A hemofiltration system was used with an artificial lung (5 m², hollow fibre membrane) instead of the hemofilter cartridge. Either propelled by the arteriovenous pressure difference or by the pump, blood was driven through the device. Oxygen was used as sweep gas.

Results

In the pumpdriven circuit CO₂ removal rates of 130 to 180 ml/min were achieved with blood flow rates between 470 and 600 ml/min. With the pumpless shunt, up to 90 ml/min of CO₂ were eliminated.

Commentary

This article is relevant because it shows that standard hemofiltration equipment can be combined with an appropriate extracorporeal gas exchange system to achieve a removal of the basal metabolic CO₂ production at low blood flow rates. Hemofiltration equipment is frequently found and commonly used in intensive care units.

This makes it possible to use extracorporeal CO₂ removal as often as hemofiltration, thus allowing a routine decrease in ventilation invasiveness in many patients on intensive care.

