COMPARISON OF NORMAL SALINE, HYPERTONIC ALBUMIN AND HYPERTONIC ALBUMIN PLUS TERLIPRESSIN RESUSCITATION IN AN INFANT ANIMAL MODEL OF HYPOVOLEMIC SHOCK

Methods Prospective, randomized study in 30 two month-old pigs (9.9±2kg). Following mechanical ventilation, hypovolemia was induced by controlled 30 ml/kg bleed. After 30' pigs randomly received: Normal Saline (NS) 30 ml/kg, n=10; Albumin 5% plus Hypertonic 3% Saline (AHS) 15 ml/kg, n=10, or single bolus of terlipressin 20 µg/Kg iv plus AHS (TAHS) 15 ml/kg, n=10, over 30 min. Heart rate (HR), mean arterial pressure (MAP), cardiac index (CI), brain tissue oxygenation by near infrared spectroscopy (bTOI), internal carotid artery flow (ICAF), arterial lactate and intramuscular gastric pH (pHi) were compared by ANOVA.

Results 30' after bleeding as well as 30', 60' and 90' after infusion no significant differences between groups were observed. However, 90' after the infusions the TAHS group presented trends towards higher MAP (NS: 71±8, AHS: 74±7, TAHS: 82±7 mmHg); CI (NS: 3.2±0.3, AHS: 3.8±0.3, TAHS: 4.2±0.3 L/min/m2); lactate (NS: 1.7±1.7, AHS: 0.8±1.4, TAHS: 3.6±1.4 mmol/L); bTOI (NS: 42±5, AHS: 45±4, TAHS: 48±6%); and ICAF (NS: 41±4, AHS: 42±4, TAHS: 48±5 ml/min); with no differences in HR (NS: 166±11, AHS: 145±10, TAHS: 159±9 bpm); and pHi (NS: 7.1±0.1, AHS: 7.2±0.1, TAHS: 7.2±0.1).

Conclusion All fluids achieved similar hemodynamic and perfusion endpoints without a significant improvement secondary to the use of terlipressin.

VALIDATION OF EXTRAVASCULAR LUNGWATER MEASUREMENT BY TRANSPULMONARY THERMODILUTION IN SEVERE PULMONARY EDEMA IN A NEWBORN ANIMAL MODEL

Introduction Extravascular lung water (EVLW) can be measured at the bedside using the transpulmonary thermodilution method (TPTD), which quantifies the amount of pulmonary edema. This technique has never been validated in conditions of high indexed EVLW levels measured in infants and young children. We compared EVLW_TPTD measurements with the transpulmonary double indicator dilution method (TPDD), ice-cold indocyanin green and post mortem gravimetry.

Methods In eleven newborn lambs pulmonary edema was induced using a surfactant wash-out lavage ALI model. Serial EVLW measurements by TPTD and TPDD were performed at various levels of lung water and the final EVLW values were compared with the post mortem gravimetry results. Data were analyzed using correlation statistics (Spearman’s coefficient of rank correlation (rth)).

Results A total of 25 simultaneous TPTD and TPDD measurements from ten lambs were analyzed with a median EVLW_TPTD of 24.0 (IQR 20.7) ml/kg. One lamb died before the measurements were performed. Between EVLW_TPTD and EVLW_TPDD was r=0.94 (figure1; p<0.0001, 95%CI 0.87–0.97). Median EVLW_Gravimetry was 25.9 (IQR 9.4) ml/kg. The correlation between the final EVLW_TPTD and the EVLW_Gravimetry was r=0.93 (figure2; p<0.0002, 95%CI 0.71–0.99).

Conclusions EVLW measurements by TPTPDD in severe pulmonary edema correlate well with the gold standards.