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

doi:10.1136/archdischild-2012-302724.0012

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Background and aims To determine if in an infant animal model of hemorrhagic shock, hypertonic albumin plus single bolus of terlipressin, as opposed to isotonic crystalloid, would improve global hemodynamic and perfusion parameters. No previous experience in children or infant animal models has been reported.

Methods Prospective, randomized study in 30 two month-old piglets (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 intramucosal 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 infusion 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/m^2); lactate (NS: 1.7±1.7, AHS: 0.8±1.4, TASH: 3.6±1.4 mmol/L); bTOI (NS: 42±5, AHS: 45±4, TASH: 48±6%); and ICAF (NS: 41±4, AHS: 42±4, TASH: 48±3 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, TASH: 7.2±0.1).

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

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

doi:10.1136/archdischild-2012-302724.0013

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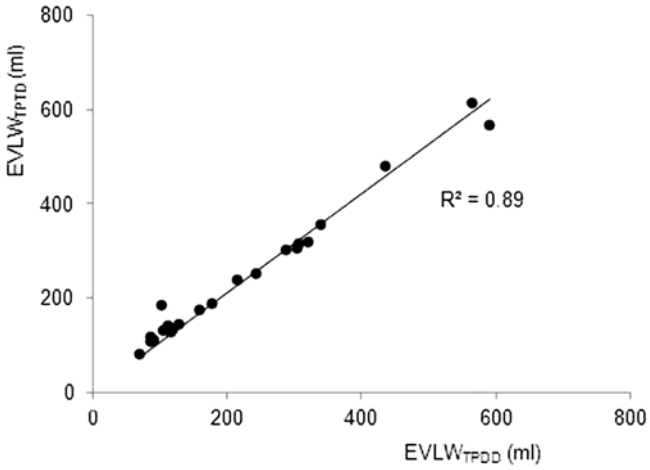
Introduction Extravascular lungwater (EVLW) can be measured at the bedside using the transpulmonary thermodilution method (TPTD), which quantifies the amount of pulmonary edema. This technique has never been validated in conditions of high indexed EVLW levels measured in infants and young children. We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

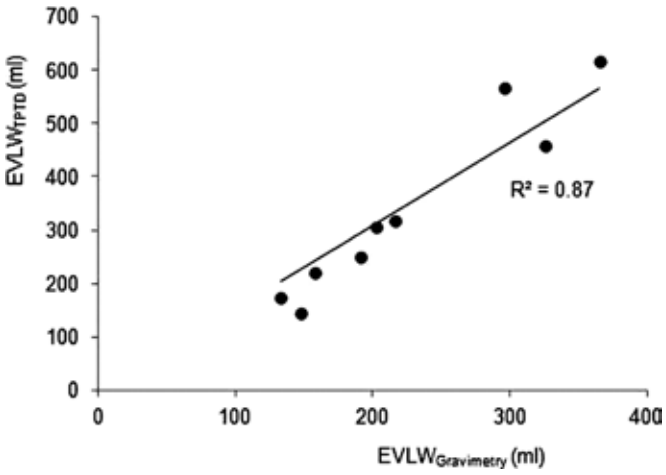
Methods In eleven newborn lambs pulmonary edema was induced using a surfactant wash-out lavage ALI model. Serial EVLW measurements by TPTD and TPDD were performed at various levels of lung water and the final EVLW values were compared with the post mortem gravimetry results. Data were analyzed using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

Results A total of 25 simultaneous TPTD and TPDD measurements from ten lambs were analyzed with a median $EVLWI_{TPDD}$ of 24.0 (IQR 20.7) ml/kg. One lamb died before the measurements were performed. Correlation between $EVLW_{TPTD}$ and $EVLW_{TPDD}$ was r=0.94 (figure1; p<0.0001, 95%CI 0.87–0.97). Median $EVLW_{Gravimetry}$ was 23.9 (IQR9.4) 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 TPTD in severe pulmonary edema correlate well with the gold standards.



Abstract 13 Figure 1 Correlation EVLW-TPTD and EVLW-TPDD



Abstract 13 Figure 2 Correlation EVLW-TPTD and EVLW-gravimetry

14 PREDICTION OF FLUID RESPONSIVENESS IN MECHANICALLY VENTILATED CHILDREN USING TRANSOESOPHAGEAL DOPPLER (TOD) AND TRANSTHORACIC ECHOCARDIOGRAPHY (TTE) IN ALGERIAN'S PICU

doi:10.1136/archdischild-2012-302724.0014

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Background and aims Circulatory failure treatment needs to assess blood volume status, in order to detect a hypovolemia requiring blood volume expansion. In this way, new dynamic echocardiographic and TOD parameters have recently been proposed in mechanically ventilated children, using the heart lung interactions, such as respiratory changes of aortic blood flow velocity, and inferior vena cava diameter.

This study aimed to compare respiratory variation in transthoracic echo-derived aortic blood flow velocity DVpeak and DIVCD with DVpeak and Doppler corrected flow times obtained by TOD.

Methods A prospective and comparative study conducted in pediatric intensive care unit investigated 11 mechanically ventilated children using TTE and TOD for each patient had tachycardia, hypotension, oliguria, delayed capillary refilling or hemodynamic instability despite vasopressor drugs.

Results VE induced significant changes in TTE and TOD, the DVpeak ao in responders was higher than that in non-responders [23% (15–32.1) vs.10% (6–14) by TTE and, [21% (14–29) vs.12% (11–13) by TOD, whereas DVCID and FTc did not significantly differ between groups.

Conclusion In this study, ΔVpeak was the most appropriate variable to predict fluid responsiveness by TTE and TOD. DIVCD and FTc are of little value in ventilated children.

15 CONVENTIONAL *VS.* RESTRICTIVE MAINTENANCE FLUID REGIME IN CHILDREN WITH SEPTIC SHOCK AFTER INITIAL RESUSCITATION: A RANDOMIZED OPEN LABEL CONTROLLED TRIAL

doi:10.1136/archdischild-2012-302724.0015

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Background Initial aggressive fluid resuscitation is of proven benefit in septic shock. Optimal post resuscitation fluid management is not known.

Aims To compare restrictive vs. conventional post-resuscitation fluid protocols in children with septic shock.

Methods We performed prospective randomized trial involving children (3 to144 months) with septic shock admitted to our PICU. After initial resuscitation, patients were randomly assigned to restrictive (A) or conventional (B) fluid protocol. The primary end point was length of PICU stay. Secondary end points included: all cause mortality, organ failure free days, ventilator-free days, measures of lung physiology and incidence of AKI. All analyses were performed on intention-to-treat basis. Intergroup differences were tested with Students' t test, Chi-square and Mann Whitney U test as appropriate and ANOVA for repeated measures. Time to event data was analyzed with Kaplan-Meier method and Mantel-Cox log rank test.

Results In 12 months period, total of 101 children were enrolled. The baseline characteristics of both groups were similar. The mean (±SD) cumulative fluid balance in initial ten days was - 42.6±82.6 ml (group A) and 339±117 ml (group B) (P<0.001). As compared to Group B, group A showed significantly more PICU free days [17.2±9vs.12.7 ±9.5days; p=0.015], lesser number of organ failures [p=0.001], higher proportion of patients recovering from organ failure [92.5vs.75%; p=0.005], improved oxygenation index and plateau pressure [p=0.001], lesser duration of ventilation [6.3±5.8 vs.9.9±5.2days; p=0.012], early recovery from shock [92.5±68.8 vs.123±87 hours; p=0.05]. Mortality was similar [18.5vs.23.4%; p=0.54].

Conclusions Restrictive fluid strategy improved lung function; shortened ventilation and ICU stay without aggravating the hemodynamic instability.

16 DELAYED CORD CLAMPING AND NEED FOR TRANSFUSIONS

doi:10.1136/archdischild-2012-302724.0016

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The requirement of donor blood transfusions is a common problem in the treatment of preterm infants, especially below 32 weeks' gestation. Upto 50% of these infants receive at least one transfusion during their hospital stay. Studies on enhancing placento-fetal transfusion have demonstrated a significant increase in circulating blood volume in preterm infants if the cord is either not clamped immediately after birth or is milked several times. The recent updated Cochrane review showed positive benefits of placento-fetal transfusion with regard to better adaptation (e.g. higher blood pressure) after birth as well as reduced intra-ventricular haemorrhage and necrotizing enterocolitis. Infants receiving extra placental blood at birth have a reduced need for donor blood transfusions during the first six weeks of life. The talk will focus on a structured review of the available literature. In addition other preventative measures of anaemia of prematurity such as early protein and iron supplementation will be reviewed.

17 RED BLOOD CELL TRANSFUSIONS IN CHILDREN

doi:10.1136/archdischild-2012-302724.0017

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All our cells need oxygen for their metabolism. Oxygen delivery is dependant on cardiac output, hemoglobin and arterial blood saturation. Therefore, red blood cells (RBC) transfusions could seem to be the best therapy to increase oxygen delivery in critically ill children. However, RBC transfusions are associated with an increased morbidity and mortality. This might be due to the storage lesions, which decrease the stored RBC's ability to transport oxygen in the microcirculation, and modify their immunomodulative properties. Therefore, one must carefully select the patients for whom the benefits will be greater than the risks.

For unstable critically ill children, it is usually recommended to transfuse for a Hb threshold of 100 g/l, after correcting the cardiac output.

For critically ill children, it is recommended to transfuse for a Hb threshold of 70 g/L. This threshold has also been validated for septic patients as well as surgery and cardiac surgery patients. For single-ventricle physiology patients, it seems reasonable to transfuse RBC units for a threshold of 90 g/L. For neonates, a higher threshold is used (Hb 120–140 g/L if FiO2 > 40%, Hb 100 g/L if FiO2 < 40%, Hb 70–80 g/L for asymptomatic infants). Lower thresholds have been proposed for chronically anemic children (Hb 50 g/L).

RBC transfusions are a common treatment, but one must be aware of the associated risks and the appropriate transfusion indications, in order to prevent unnecessary morbidity and mortality.

18 HEAD-TO-BODY DELIVERY BY 'TWO-STEP' APPROACH: EFFECT ON UMBILICAL ARTERY HEMATOCRIT AND PH

doi:10.1136/archdischild-2012-302724.0018

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Background The timing of umbilical cord clamping has a profound effect on the amount of blood that remains in the infant's circulation at birth. However, there is no evidence to support a relationship between cord clamping time and other active management techniques of labor.

Objective To examine the association between head-to-body delivery by 'two-step' approach, that include waiting for the next contraction to deliver the shoulders, and early cord clamping (< 1 min) and its effect on the amount of blood that remains in the infant's circulation at birth and cord artery blood gas parameters.

Study Design Prospective observational study on 50 consecutive at term, uncomplicated vaginal deliveries with singleton cephalic