Abstracts

786 SINGLE-CENTER EXPERIENCE WITH LEVOSIMENDAN AS AN ALTERNATIVE TO CATECHOLAMINE IN CHILDREN WITH SEVERE CATECHOLAMINE DEPENDENT END-STAGE HEART FAILURE

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Objective To describe our preliminary experience with Levosimendan during the last 4 years, a new calcium-sensitizing agent in critically unwell infants and children with severe heart failure.

Design Retrospective cohort analysis.

Setting Pediatric cardiology intensive care unit.

Patients 8 children aged 2.5 months to 13 yrs (median age 44 months) with severe myocardial dysfunction secondary to endstage heart failure who were inotropependent (requiring at least one catecholamine).

Interventions A single dose (continuous intravenous infusion for 24 hrs) of Levosimendan was given under continuous hemodynamic monitoring in our intensive care unit.

Results Six children received a single dose, two children received two doses.

Echocardiographic assessments of ventricular function were made before and 3–5 days after Levosimendan infusion.

Conclusions Levosimendan appeared to be a safe and efficacious drug when given to children with uncompensated end-stage heart failure in this size-limited sample. It warrants formal prospective large-cohort evaluation and multicenter trial to determine its safety and clinical application in the pediatric population.

787 LOW PLATELET COUNT IS ASSOCIATED WITH DUCTUS ARTERIOSUS PATENCY IN PRETERM NEWBORNS

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Background and Aims To determine whether there is an association between platelet counts and patent ductus arteriosus (PDA) incidence and/or closure in preterm newborns.

Methods Premature infants with hemodynamically significant PDA (n=154) and a control group without PDA (n=207) who were hospitalized in the NICU were eligible. Platelet counts and other platelet indices including mean platelet volume (MPV) and platelet distribution width (PDW) of the infants in both groups during the first 5 days of life were recorded. Ibuprofen was started in infants with hemodynamically significant PDA and echocardiography was repeated 48 hours thereafter to assess the closure of ductus.

Results Median gestational age and birth weight of the infants with PDA were 28 (range 26–29) weeks and 1060 (range 892–1250) gr respectively. Platelet counts were significantly lower in the patient group than in the control group (p<0.001). Multivariate analysis including gestational age, presence of RDS, presence of thrombocytopenia and PDW showed that platelet count < 150,000 (OR=2.13, 95% CI 1.26–3.61, p=0.005), high PDW (>17) (OR=2.68, 95% CI 1.41–5.09, p=0.005) and the presence of RDS (OR=2.25, 95% CI 1.41–3.59, p=0.001) were independently associated with higher risk of hemodynamically significant PDA. Baseline platelet counts of the infants in whom ductus closed or persisted after ibuprofen treatment were similar.

Conclusions Low platelet count was associated with ductus arteriosus patency in preterm infants while other platelet indices were not. We could not show an association between platelet counts and persistence or closure after medical treatment.

788 FETAL HYPOXIA-ISCHEMIA IS RELATED TO CIRCULATORY COMPROMISE IN PRETERM INFANTS

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Background and Aims Impairment of gas exchange and blood flow through the placenta leads to hypoxia and hypercapnia. This causes increased systemic vascular resistance and tachycardia, thus compromising the cardiovascular system of the foetus. The biomarker B-type natriuretic peptide (BNP) can be used to identify significant cardiovascular compromise in infants. The aim of the present study was to investigate whether BNP can be used to identify those preterm infants with significant cardiovascular compromise during peripartum period.

Methods In this retrospective cohort study all infants born after a gestational age of less than 32 weeks were evaluated. Maternal, fetal and infant factors associated with prenatal and perinatal hypoxia-ischemia were related to BNP levels after birth. Pathologic examination of the placenta was routinely performed.
Results In total 164 infants were evaluated. Infants with increased placental ischemia and a higher placental maturation score had elevated levels of BNP at birth ($r^2 = 0.12; p < 0.001$). Furthermore BNP was found to be associated with (chronic) prenatal hypoxia-ischemia (nucleated red blood cells ($r^2 = 0.22; p < 0.001$); intraventricular growth retardation ($r^2 = 0.18; p = 0.01$); postnatal thrombocytopenia), and acute perinatal hypoxia (umbilical artery pH ($r^2 = 0.14; p < 0.001$); serum lactate ($r^2 = 0.11; p < 0.001$).

Conclusion Elevated BNP levels after birth are found in those preterm infants with significant perinatal hypoxia-ischemia and are possibly related to placental dysfunction. If BNP levels are related to prenatal signs of circulatory compromise needs further investigation.

IMPACT OF OPEN DUCTUS ARTERIOSUS ON CEREBRAL OXYGENATION DURING THE FIRST DAY OF LIFE

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Background In neonates the ductus arteriosus (DA) plays an important role in hemodynamics and oxygenation. Aim of this study was to analyse influence of an open DA on cerebral tissue oxygenation (crSO2) during the first day of life.

Methods In this prospective observational study near-infrared-spectroscopy (NIRS) measurements were performed on the right forehead during the first 24 hours of life in preterm and term infants. Cardiac ultrasound was performed immediately after birth, 3 h after phototherapy. Rates of bradycardia (heart rate $< 80$ bpm) and oxygen desaturation ($< 80\%$) were determined for each of the 3 observation periods.

Results Body temperature (37.0/37.1/37.2°C; $p < 0.001$) and heart rate (142/149/148 bpm; $p < 0.001$) increased significantly, while tcpCO2 decreased (42.5/38.0/37.0 mmHg; $p < 0.001$). Average oxygen saturation and respiratory rate remained unchanged. Rates of bradycardias and desaturations decreased after phototherapy, compared to rates before or during phototherapy ($p < 0.001$ for both parameters), and numbers of infants with a least one bradycardia/hypoxic event declined (15/10/2).

Conclusions Phototherapy was not associated with increased cardiorespiratory instability. Unexpectedly, episodes of apnea and bradycardia decreased significantly during the first 3 hours after phototherapy.

EFFECTS OF AQUAPHOR ON TRANSEPIDERMAL WATER LOSS AND ELECTROLYTE BALANCE IN PRETERM NEWBORN INFANTS

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Background The skin of the preterm infant is immature at birth and unable to serve as an effective epidermal barrier whose major functions and prevention of transdermal water loss (TEWL).

The Aim of the study is to determine the effect of topical ointment therapy (Aquaphor) in newborn preterm infants on their TEWL measured using total body water (TBW), fluid intake and metabolic balance in the first week of life. Secondary outcomes were all so noted (sepsis, CLD, PDA and IVH).

Methods This is a prospective randomised controlled trial in a single tertiary centre. Twenty six newborn preterm infants <30 weeks gestation were randomised into 2 groups; treatment with Aquaphor or a control group. The infants TBW was measured using the Body Stat method as described for neonates by Tang that measured total body water content using bioelectric impedance.

Results There was no statistically significant difference in TBW between the 2 groups from day 4–7 of life. However, the treated group showed an improved trend in their base deficts from day 1 to 7 when compared to controls. This finding supports the hypothesis that metabolic balance in extreme preterm babies may improve with Aquaphor treatment in the first week of life.

Conclusions There was no increase in sepsis or metabolic derangement. Rather, the trend was for better metabolic balance in the treated group from day 1–7 when compared to controls. Larger studies are needed to elucidate the role of Aquaphor in preterm fluid control.

EFFECT OF PHOTOTHERAPY ON EPISODES OF APNEA AND BRADYCARDIA IN PRETERM INFANTS BREATHING SPONTANEOUSLY

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Background and Aims We asked whether rates of apnea and bradycardia increase during phototherapy in preterm infants breathing spontaneously.

Methods Preterm infants (n=60, median gestational age 28 weeks (range 24–32), birth weight 1205 g (630–1750), age at study 3 d (1–10) receiving phototherapy for hyperbilirubinemia (total serum bilirubin 8.5 (4.2–16.1) mg/dl) underwent continuous registration of body temperature, heart rate, respiratory rate, arterial oxygen saturation, and transcutaneous (tc) pCO2 for 12 h (3 h before, 6 h during, 3 h after phototherapy). Rates of bradycardia (heart rate <80 bpm) and oxygen desaturation (< 80%) were determined for each of the 3 observation periods.

Results Body temperature (37.0/37.1/37.2°C; $p < 0.001$) and heart rate (142/149/148 bpm; $p < 0.001$) increased significantly, while tcpCO2 decreased (42.5/38.0/37.0 mmHg; $p < 0.001$). Average oxygen saturation and respiratory rate remained unchanged. Rates of bradycardias and desaturations decreased after phototherapy, compared to rates before or during phototherapy ($p < 0.001$ for both parameters), and numbers of infants with a least one bradycardia/hypoxic event declined (15/10/2).

Conclusions Phototherapy was not associated with increased cardiorespiratory instability. Unexpectedly, episodes of apnea and bradycardia decreased significantly during the first 3 hours after phototherapy.

PREDICTORS OF FLUID RESPONSE IN A ANIMAL MODEL OF HEMORRHAGIC SHOCK

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Background and Aims Prediction of fluid response is of paramount importance when managing shock. The aim of the present study was to test the hypothesis that pre-infusion values of several hemodynamic and perfusion parameters could help to predict fluid responsiveness in an infant animal model of hemorrhagic shock.

Methods Prospective, observational study in 20 two month-old piglets (9.9±2kg). Following mechanical ventilation, hypovolemia was induced by controlled 30 ml/kg bleed. After 30' pigs received Normal Saline (NS) 30 ml/kg, n=10 or Albumin 5% plus Hypertonics.