objective was to determine if delayed cyclosporine treatment was still effective in protecting asphyxiated piglets. We hypothesize that both early and delayed treatment with cyclosporine A would improve cardiac recovery during resuscitation of asphyxiated newborn piglets.

Methods Thirty piglets (1–4 days-old) were instrumented for continuous monitoring. After stabilization, normocapnic alveolar hypoxia (10–15% oxygen) was instituted for 2h followed by reoxygenation for 6h. Piglets were block-randomized to receive either early (5 min of reoxygenation) or delayed (120 min reoxygenation) intravenous bolus of cyclosporine (10-mg/kg) or saline (control) at identical times during reoxygenation (n=8/group). Myocardial and intestinal lactate concentrations as well as histological examinations were determined.

Results Hypoxic piglets had cardiogenic shock (cardiac output 52±1% of baseline), hypotension and acidosis. Although both early and delayed cyclosporine treatment improved cardiac output (P<0.05 vs. controls), only early cyclosporine treatment improved stroke volume and systemic oxygen delivery (p<0.05 vs. controls). Left ventricle and intestinal lactate were higher in controls than in both cyclosporine-treated groups. Early, but not delayed, cyclosporine treatment also attenuated intestinal injury compared to controls (P<0.05).

Conclusion This study demonstrates that both early and delayed cyclosporine treatment during resuscitation improves cardiac recovery in asphyxiated newborn piglets. However, early treatment with cyclosporine may offer superior cardioprotection and attenuates H-R intestinal injury.

317 THE CARDIO-PROTECTIVE EFFECTS OF DOXYCYCLINE IN A SWINE MODEL OF NEONATAL ASPHYXIA

doi:10.1136/archdischild-2012-302724.0317

[1]J LaBossiere, [1]JS Pelletier, [1]D Bigam, [1,2]PY Cheung. *[1]Surgery; [2]Pediatrics and Pharmacology, University of Alberta, Edmonton, AB, Canada*

Background Myocardial reoxygenation injury following asphyxia in neonates is common. Matrix metalloproteinase-2 activation is associated with myocardial ischemic-reperfusion injury and stunning. Previous *in vitro, ex vivo,* and small animal studies have demonstrated the cardio-protective qualities of doxycycline, a known inhibitor of matrix metalloproteinase-2, however, large animal models demonstrating this effect are lacking. We hypothesized that doxycycline would improve cardiac recovery and systemic hemodynamics in asphyxiated newborn piglets.

Methods Piglets (1–5 days old) were acutely instrumented for continuous monitoring of heart rate, cardiac output [CO], mean systemic and pulmonary arterial pressures (SAP and PAP, respectively). After stabilization, 2hrs of normocapnic alveolar hypoxia (10–15% oxygen) was induced followed by 4hrs of normoxic reoxygenation (21% oxygen). Piglets were blindly randomized to receive either normal saline or doxycycline (3, 10, or 30mg/kg) intravenously 5 minutes into reoxygenation (n=7/group). Sham-operated piglets (n=5) received no hypoxia-reoxygenation.

Results Asphyxiated piglets demonstrated acidosis (pH=7.04± [SD]0.08), hypotension (SAP=31±3mmHg), and cardiac dysfunction (CO= 58±8% of normoxic baseline). Doxycycline had dose-related improvements in CO and stroke volume (30 mg/kg: 86±8% and 79±15% of normoxic baseline vs. 65±7% and 50±13% in controls, respectively [both p<0.05]), with no significant change in heart rate compared to controls. Furthermore, SAP was higher and PAP/SAP ratio was lower than those of controls (p<0.05), with no difference in PAP.

Conclusions In an established swine model of neonatal hypoxia-reoxygenation, post-resuscitation administration of intravenous doxycycline improves cardiac recovery with beneficial hemodynamic effects in systemic and pulmonary circulations.

Funded by Canadian Institutes of Health Research (CIHR).

318 CAN EARLY B-TYPE NATRIURETIC PEPTIDE ASSAYS PREDICT SYMPTOMATIC PATENT DUCTUS ARTERIOSUS IN EXTREMELY LOW BIRTH WEIGHT INFANTS?

doi:10.1136/archdischild-2012-302724.0318

[1]JH Lee, [2]JH Shin, [3]KH Park, [2]YJ Rhie, [1]MS Park, [2]BM Choi. *[1]Department of Pediatrics, Ajou University School of Medicine, Suwon; [2]Departement of Pediatrics, Korea University College of Medicine, Ansan-Si; [3]Department of Pediatrics, CHA Gangnam Medical Center, Seoul, Republic of Korea*

Background and amis Optimal management of a patent ductus arteriosus (PDA) is important for improving the clinical outcomes of extremely low birth weight (ELBW) infants. Although it is reported that prophylactic cyclooxygenase inhibitors result in favorable immediate outcomes, not only serious side effect such as nephrotoxicity but also unnecessarily drug exposure without benefit are inevitable. To investigate the predictability of B-type natriuretic peptide (BNP) for early targeted treatment of hemodynamically significant PDA (hsPDA) in ELBW infants.

Methods 73 ELBW infants that underwent echocardiographic evaluation and plasma BNP measurement after birth were enrolled. 31 infants developed hsPDA (HsPDA group) and 42 infants didn't develop hsPDA (nPDA group).

Results BNP levels of HsPDA group were significantly higher than those of nPDA group at 24 hours of age (921[318–2133] vs. 152[91–450], pg/mL) but not different at 12 hours of age. BNP levels at 24 hours of age were significantly correlated with the magnitudes of the ductal shunt but not significant at 12 hours of age. The area under the receiver operator characteristic curve of BNP levels for prediction of hsPDA at 12 and 24 hours of age was 0.584 and 0.830, respectively. At the cutoff BNP level of 200 pg/mL and 900 pg/mL at 24 hours of age, the sensitivity was 83.9% and 54.8% and the specificity was 61.9% and 95.2%, respectively.

Conclusions BNP levels at 24 hours of age can be used as a guide for early targeted treatment of hsPDA and avoid the unnecessary use of cyclooxygenase inhibitors in ELBW infants.

319 THE EFFECT OF MILRINONE INFUSION ON CEREBRAL PERFUSION IN NEONATES WITH CONGENITAL HEART DISEASE PRIOR TO CARDIAC SURGERY

doi:10.1136/archdischild-2012-302724.0319

[1,2]MO Bianchi, [1]PY Cheung, [1]E Phillipos, [2]A Aranha-Netto, [1]C Joynt. *[1]Pediatrics, University of Alberta, Edmonton, AB, Canada; [2]Pediatrics, UNICAMP, Campinas, Brazil*

Background Milrinone has been increasingly used in the post-operative care of neonates with congenital heart disease (CHD) for its inotropic and vasodilatation properties. When used as a pre-operative cardiovascular supportive agent, cerebral hemodynamic effects of milrinone have not been studied.

Methods From June 2008 to July 2010, 18 neonates with CHD and treated with milrinone before cardiac surgery were prospectively enrolled. Milrinone (0.75mcg/kg/min) was given according to institutional guidelines and neonates (n=1) requiring additional vasoactive agents were excluded. Using Doppler studies, cardiac output (CO), flow velocity (Vm) and Resistive Index (RI) for anterior and middle cerebral arteries were assessed and analyzed blindly at specific time-points after milrinone administration.

Results Seventeen neonates were studied (gestation: 39.5[36–41] weeks; birth-weight: 3350[2590–4230]g). Hypoplastic left heart syndrome was the most common CHD. Milrinone was commenced at day 1–7 (88% on day 1) of life, with heart rate 141±[SD]14bpm, mean blood pressure 44±6mmHg and CO 479±147ml/min/kg at baseline. At 6h, 24h and 48h, CO was significantly increased by 23%, 20% and 28% from pre-treatment baseline, respectively, with increased anterior (22%, 35%, 38%) and middle (34%, 36%, 35%) cerebral Vm. There were no significant changes in heart rate