Methods Newborn piglets underwent hypoxia following a standardized model. They were randomly assigned for 30 min resuscitation with air (21% O_2) (n=12) or 2.1% Hydrogen gas mixed into synthetic air, H_2, (n=14) and then observed for 9 hours. One control group (n=6) went through the same procedures and observation time (anesthesia, surgery, ventilation and sample collection). The left hemisphere was used for histopathology. Tissue from prefrontal cortex and liver were snap frozen in liquid nitrogen and stored by –70° C until analysis. The tissue samples were homogenized and the protein extracted. A Quantikine KM 300 immunoassay was used to measure activated caspase-3. protein. Gene expression for Casp-3, BDNF, MMP-2, MMP-9 and VEGFR2 was measured in tissue from prefrontal cortex and liver.

Results The use of 2.1% hydrogen gas mixed into synthetic air decreased activated caspase-3 vs. air. In liver tissue piglets resuscitated with air: 12.6 pg/mg protein SD (9.1) vs. H_2: 5.3 (4.9), p=0.031 whereas in cortex piglets resuscitated with air 26.3 pg/mg protein (14.9) vs. H_2 15.4 (13.0), p=0.05.

There were no significant changes in gene expression in liver and cortex. Histopathology showed a tendency to less brain damage in the hydrogen group.

Conclusions Hydrogen gas used for newborn resuscitation may reduce apoptosis.

1115 THE NEUROPROTECTIVE EFFECTS OF VALPROIC ACID, AN HISTONE DEACETYLASE INHIBITOR IN A NEONATAL HYPOXIC-ISCHEMIC RAT MODEL

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Introduction Neurodegenerative diseases were associated with a decrease in histone acetylase transferase (HAT) activity, resulting in relative over-deacetylation. Histone deacetylase (HDAC) inhibitors were suggested as potentially neuroprotective agents. The aim of this sudy was to evaluate the neuroprotective effects of valproic acid (VPA), an histone deacetylase inhibitor, in beonatal hypoxic ischemic rat model.

Methods After being anesthetized, 7-day-old pups underwent ischemia followed by exposure to hypoxia. The pups were divided into 3 groups: sham group, vehicle group (saline group) and VPA group. VPA was administered intraperitoneally for three times; the first just after hypoxia-ischemia, the second and the third doses 24 and 48 hours after the first dose, respectively. After sacrification; brain infarct volume, apoptosis, HDAC activity, acetylated H4 protein and caspase 3 expression, and proinflammatory cytokine concentrations were evaluated in brain tissue of rat pups.

Results Percent infarcted brain volume and number of TUNEL positive cells per unit area in hippocampus and cortex CA1 were markedly reduced with VPA treatment. HDAC activity was found to be significantly reduced in VPA group, whereas acetylated H4 protein expression was significantly increased with VPA treatment. The caspase-3 activity in VPA group was significantly lower than the control group. The roinflammatory cytokine levels also significantly decreased with VPA treatment.

Conclusion This is the first study that showed the neuroprotective effects of VPA treatment as an HDAC inhibitor by reducing percent infarcted brain volume, histone deacetylase activity, inflammation and apopotosis while increasing acetylated H4 protein levels in a neonatal hypoxic-ischemic rat model.

1116 HYPERGLYCAEMIA AND INSULIN-INDUCED ALTERATIONS IN THE RETINA OF RAT PUPS

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Background and Aims Rat pups are applicable to investigate specific role of the factors which are implicated in the pathogenesis of retinopathy of prematurity (ROP) including **hyperglycaemia and insulin treatment.**

Methods The aim of our study was to investigate specific effect of streptozotocin-induced hyperglycaemia, insulin-treatment and intravitreal injection of a potential retinoprotective agent, pituitary adenylate cyclase activating polypeptide (PACAP) on the rat pups' retina. We made a comparative analysis between the following treatment-groups: controls (Stz-/Ins-), insulin-treated (Stz-/Ins+), hyperglycaemic (Stz+/Ins-), insulin-treated hyperglycaemic (Stz+/Inz+); all animals were treated with intravitreal PACAP or vehicle. Blood glucose levels were monitored. The retinas were processed on P21 for routine histology and immunohistochemistry for glial fibrillary acidic protein (GFAP), GLUT1 and tyrosine hydroxylase (TH).

Results Standard histological methods revealed no major differences between the groups. Elevated expression of GFAP – as an aspecific marker of metabolic insults in the retina- was detected from the inner retina in the Stz-/Ins+ group, although hypoglycaemia didn't develop. Similar alteration of the GFAP staining was found in the hyperglycaemic (Stz+/Ins-) and insulin-treated hyperglycaemic (Stz+/Inz+) groups. Intravitreal PACAP resulted in suppression of the elevated GFAP expression in the Stz-/Ins+ group, but not in the Stz+/Ins-, and Stz+/Inz+ ones. None of the groups showed alteration in the anti-TH immunoreactivity (dopaminergic amacrine cells) or GLUT1 expression of pigment epithelial cells.

Conclusions In our model hyperglycaemia or insulin did not induce ROP; however, sign of metabolic insult was detected in the neural retina, which was partly prevented by intravitreal PACAP application.

1117 A PIG MODEL OF THE PRETERM NEONATE: ANTHROPOMETRIC AND PHYSIOLOGICAL CHARACTERISTICS

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Background and Aims Large animal models are an essential research tool to investigate the physiology of the preterm infant, which remains poorly understood. We aim to describe the pig model of the preterm neonate in terms of growth, maturation and requirement for intensive care over a range of gestational ages and determine the effects of maternal glucocorticoid exposure and sex.

Methods Twenty-nine litters of piglets (N=305) were delivered by C-section at 91d, 94d, 97d, 100d, 104d and 113d (term 115d). Some litters received maternal betamethasone treatment (0.19mg/kg body wt; IM) at 48h and 24h prior to delivery. At 97d piglets were resuscitated, surfactant administered, and piglets were ventilated, sedated and monitored for 6–8h post-birth using standard NICU techniques.

Results At 91d, piglets were half the weight of term animals, had fused eyelids, very thin skin, no hair, and survived a maximum of 3h due to difficulties with ventilation. At 97d piglets were able to be maintained for at least 6–8h but physiology was unstable for 1–2h. Piglets 100d and older breathed spontaneously. Only near term piglets were able to maintain body temperatures. Males were heavier than females at 113d gestation (p=0.021). Exposure to maternal glucocorticoids resulted in larger females and influenced brain:body wt.

Conclusions The piglet provides a useful model of preterm neonatal physiology as very preterm piglets can be survived under standard intensive care conditions. The large litters allow for parallel experiments or the use of littermates as controls.

1118 CONGENITAL HEART DISEASE DISTRIBUTION IN A TERTIARY NEONATAL INTENSIVE CARE UNIT

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Background & aim Congenital heart malformation (CHM) is one of the most frequent and important abnormalities in newborns. In this study we retrospectively analyzed the frequency and distribution of the congenital heart diseases in our NICU.
Method Newborns hospitalized in NICU between 2005 and 2011 were retrospectively analyzed. Gestational age, birth weight, consanguinity, type of congenital heart disease extracted from the computerized database. CHMswere classified as follows; left-to-right shunt, obstructive, cyanotic with decreased pulmonary flow, cyanotic with increased pulmonary flow and others.
Results A total of 706 newborns were diagnosed as congenital heart disease during 7-year study period among the 7450 admission (9.5%). Consanguinity rate was 22.3% and 30.4% of these were first degree relatives. 42.7%, 17.3%, 13%, 11.6% were left-to-right shunt, obstructive, cyanotic with decreased pulmonary flow, cyanotic with increased pulmonary flow and others, respectively. Most frequent heart malformations were ASD (25.5%), VSD (12.6%), Aortic coarctation (10.8%), PDA (9.5%), TGA (8.8%), pulmonary atresia (8.2%), AVSD (4.1%), hypoplastic left heart (3.8%), pulmonary stenosis (3.1%), TOF (2.5%). 37 % of the newborns had at least one congenital malformation in other organ systems.
Conclusion ASD, VSD and aortic coarctation were most common congenital heart disease followed in our NICU.

1119 EVALUATION OF THE QT INTERVAL IN SMALL FOR GESTATIONAL AGE BABIES

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The objective of this study was to evaluate the QT interval and the effects of intrauterine malnutrition in small for gestational age babies (SGA). In this study, ECGs were recorded on their postnatal day five. Twenty-two SGA infants and 20 appropriate for gestational age babies (AGA) were evaluated. Heart rate, QT interval, QT interval corrected for heart rate (QTc), QT dispersion (QTD) and QTc dispersion (QTcD) were calculated for all infants.

The mean QT and QTc were 265±47 msec, and 379±45 msec in the small for gestational age babies; whereas in the appropriate for gestational age babies the mean QT and QTc were 254±30 msec, and 367±33 msec ($p>0.05$). QTD was found 37±9 msec and, 30±9 msec in the SGA and AGA babies respectively. QTcD was found as 57±15 msec and, 47±12 msec in the SGA and AGA babies respectively. QTD and QTcD were found to be higher in the small for gestational age babies ($p<0.05$). Significantly negative correlations were detected between the birth weight and QTD and QTcD ($p<0.05$; $r= -0.380$ and -0.360, respectively).

The present findings suggest that QTD and QTcD values are significantly increased in SGA babies and it can be show deterioration of ventricular repolarization. Small for gestational age may be associated with an increased risk for the arrhythmia and sudden infant death.

1120 TISSUE DOPPLER IMAGING QUANTIFIES EARLY CHANGES IN PRETERM MYOCARDIUM

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Introduction Haemodynamic changes occurring during the fetal – neonatal transition may impact on global myocardial function in the first week of life. Tissue Doppler imaging (TDI) offers a novel technique to measure changes in systolic and diastolic function in neonates.
Aims To use TDI to assess myocardial function in preterm infants compared to gold standard measures.
Methods Preterm infants < 32 weeks gestation were recruited. Echocardiography was carried out by a single observer (KA) using the GE Vivid I, on Day 1, 3–4 and Day 7. Clinical parameters were recorded at time of echocardiogram. Standard M mode echocardiography was used to determine shortening and ejection fraction. Myocardial velocities were obtained using a pulsed wave doppler sample from the lateral mitral/tricuspid annuli and intraventricular septum from an apical four chamber view. Peak systolic (S'), early diastolic (E') and late diastolic (A') velocities were recorded.
Results 140 echocardiograms were performed on 60 neonates with structurally normal hearts. Gestational age range-23^{+6}–31^{+6} weeks. There was a significant increase in heart rate ($p=0.002$)and systolic blood pressure over the 1st week. ($p=0.001$). There was an increase in myocardial velocities across all measurements, with right ventricular early systolic and late diastolic velocities increasing significantly ($p<0.002$). There was a significant increase in the left ventricle late diastolic velocities ($p=0.036$). There was no significant difference in shortening/ejection fraction over the first week.
Conclusion TDI offers a reliable measure of myocardial velocities over the first week. Current gold standard measures shortening/ejection fraction showed no significant change in myocardial contractility however TDI demonstrated significant changes in both RV and LV systolic and diastolic velocities.

1121 AN ALTERNATIVE DRUG (PARACETAMOL) IN THE MANAGEMENT OF PATENT DUCTUS ARTERIOSUS IN IBUPROFEN RESISTANT OR CONTRAINDICATED PRETERM INFANTS

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Background and Aim The aim of this study was to evaluate the efficacy of paracetamol in preterm infants with patent ductus arteriosus (PDA) who failed to respond to ibuprofen treatment and/or for whom treatment with ibuprofen was contraindicated.
Methods Preterm infants with PDA who were ibuprofen-resistant and/or for whom ibuprofen treatment was contraindicated were started on paracetamol treatment with parental consent. Paracetamol was administered at a dose of 60 mg/kg/day, in 4 divided doses, for a period of 3–7 days. In the absence of closure of PDA, treatment was extended up to 7 days, after which repeat echocardiographic examination was performed.
Results A total of 8 preterm infants were included in the study with a median gestational age of 28.5 weeks (minimum-maximum: $23^{4/7}$–$36^{5/7}$) and a median birth weight of 995 grams (range 630–2970). The first dose of paracetamol was given after a median of 9.5 days (range 5–27), for a median duration of 5 days (range 3–7). Median PDA diameter was 2.3 (range 2–3.5). Paracetamol resulted in successful closure of PDA in 7 (87.5%) patients, while 1 patient (12.5%) did not respond to treatment.
Conclusions To date, our case series is the largest to evaluate the efficacy of paracetamol for the management of PDA. We believe