Results Ninety-one healthy term infants aged 1 to 36 hrs were studied (< 6 hrs – 21, 6–12 hrs – 47, 13–24 hrs – 11, and 25–36 hrs – 12). A well-developed SWC was evident as early as within the first 6 hrs after birth. The mean (SD) percentage of active sleep (AS) was 52.1% (12.9), quiet sleep (QS) - 38.6% (12.5). AS was longer and QS shorter in infants delivered by elective caesarean section (CS) compared to infants delivered by vaginal delivery (AS: p=0.01; QS: p=0.02) or emergency CS (AS: p=0.04, QS: p=0.02). Five infants did not have any SWC present. Disrupted SWCs correlated significantly with the absence of a spontaneous onset of labour (p=0.03).
Conclusion This is the first time that SWC composition has been quantified using EEG monitoring so early in the postnatal period. AS dominates and SWC is clearly present immediately after birth. SWC composition appears to be influenced by labour and mode of delivery.

1080 3D DIGITAL CAPTURE OF HEAD GROWTH IN NEONATES - CORRELATION OF HEAD CIRCUMFERENCE AND HEAD VOLUME

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W Burkhardt, S Ifflaender, A Koch, M Rüdiger. *Department of Neonatology and Paediatric Intensive Care, University Hospital Carl Gustav Carus, Dresden, Germany*

Background Head circumference (HC) is measured in newborns to evaluate head growth. It is not known, whether HC is always an appropriate measure of head volume (HV). Digital capture of the neonatal head offers information on HC and HV.
Aims To determine

a) overall correlation of HC and HV and
b) with regard to postmenstrual age (PMA) and
c) with regard to the actual body weight (BW).

Methods Head measurements with STARscanner laser shape digitizer (Vorum research Corp., Vancouver, BC) were performed in preterm infants prior to discharge over a 12 month period. Data on HC and HV were calculated with STARscanner Laser Data Acquisiton System (Orthomerica, Orlando, FL) and analyzed in different subgroups.
Results Included were 243 neonates at time of discharge *(mean HC 32.8±1.9 cm, mean HV 356.7±64.3 ml)*. a) There was an overall correlation between HC and HV *($r=0.90$, $R^2=0.81$, $p<0.001$)*. Correlation between HC and HV was: b) in infants with a PMA < 37 *($r= 0.71$, $R^2=0.52$, $p=0.001$)* vs. PMA > 37 weeks (r=0.92, *$R^2=0.85$, $p<0.001$) and* c) in BW < 2500g *($r=0.69$, $R^2= 0.49$, $p=0.04$)* vs. BW >2500g *($r=0.88$, $R^2=0.77$, $p<0.001$)*.
Conclusions Neonates with comparable HC can show very different HV, especially in infants with low PMA or BW. Thus additional measurement of HV enables to detect variable patterns of head growth and shape. Underlying causes and the meaning for neurological outcome need to be determined.

1081 LEVELS OF SERUM N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE, CYSTATIN C, AND URINARY B2 MICROGLOBULIN IN NEWBORNS WITH HYPOXIC ISCHEMIC ENCEPHALOPATHY

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B Aydin, D Dilli, S Erol, E Ozyazici, S Beken, NE Cullas Ilarslan, A Zenciroglu, N Okumus. *Neonatology, Dr Sami Ulus Maternity and Children's Health and Diseases Training and Research Hospital, Ankara, Turkey*

Background and Aim Levels of serum N-terminal pro-brain natriuretic peptide (NT-proBNP), cystatin-C ve urinary β2 microglobulin in newborns with hypoxic ischemic encephalopathy (HIE) were examined in this study.
Methods In this study, 25 infants diagnosed with HIE were evaluated prospectively. The diagnosis was made according to criterias of American Gynaecelogy and Obstetric Academy (ACOG, 2003). Serum creatinine, NT-proBNP, cystatin C and urinary β2 microglobulin in all patients were measured on the 1st and 5th days of hospitalization.
Results The mean gestational age was 38.7 weeks and the birth weight was 3255 grams. Patients were classified as stage-1 (n=5), stage-2 (n=15) and stage-3 (n=5) HIE according to Sarnat classification. Therapeutic hypothermia was established in 6 patients. Acute renal failure (ARF) developed in 3 cases with stage 3 HIE. Peritoneal dialysis was performed for 2 of them. First day serum creatinine levels were higher than the 5th day levels (p=0.01). NT-proBNP and cystatin-C levels was significantly lower on the fifth day (p=0.01). Although not statistically significant, urinary β2 microglobulin (mg/g cre) levels on the 1st day were higher than the 5th day (p=0.40). On the first day of hospitalization, a statistically significant correlation between NT-proBNP and creatinine (p=0.02), cystatin-C (p=0.01) and urinary β2 microglobulin levels (p=0.01) were determined. NT-proBNP and cystatin-C levels were significantly high on the first day in infants developing ARF.
Conclusion It may be beneficial to evaluate serum N-terminal proBNP ve cystatin-C with creatinin levels in HIE patients for the diagnosis, severity and follow-up of ARF.

1082 BLOOD PRESSURE AND AMPLITUDE INTEGRATED ELECTROENCEPHALOGRAPHY CORRELATIONS IN FULL TERM NEONATES WITH HYPOXIC ISCHAEMIC ENCEPHALOPATHY

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[1]M Krasovitsky, [1,2]Z Kecskes. *[1]Medical School, Australian National University, Canberra; [2]Department of Neonatology, Canberra Hospital, Woden, ACT, Australia*

Background The correlation between systemic blood pressure (BP) and amplitude integrated electroencephalography (aEEG) in full term neonates with hypoxic ischaemic encephalopathy (HIE) is clinically complex, affecting therapy and prognosis.
Method Term infants with HIE and < 48 hours of age were identified from a prospectively kept database. Mean (MAP), systolic and diastolic blood pressure was recorded over a four hour period. aEEG patterns and corresponding output (in μV) of crosshead, right and left leads over the same period were recorded and analysed. The cohort was analysed according to a range of variables including treatment or non-treatment of hypotension and degree of encephalopathy.
Results Twenty-nine episodes of hypotension experienced by twenty-one full term neonates with HIE were recorded. In the cohort, MAP was correlated with aEEG changes two and three hours after hypotension at with a correlation coefficient (r) of 0.454 and 0.477. In the non-treated group, there was a significant correlation between MAP and all leads across the time period with r ranging from 0.498 to 0.768. Neonates with HIE stage III had a significantly stronger correlation between BP and aEEG over the time period compared to those with HIE stage II.
Conclusions There is a correlation between blood pressure and aEEG in neonates with HIE. This is especially evident in non-treated and the most encephalopathic neonates. These results may guide clinical practice in NICUs.

1083 THE HIGHLY SELECTIVE SIGMA-1 RECEPTOR AGONIST PRE-084 REDUCES INFLAMMATION-SENSITIZED HYPEROXIA-INDUCED INJURY IN THE DEVELOPING RAT BRAIN

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[1]A Posod, [1]Y Krepp, [1]V Neubauer, [1]K Wegleiter, [1]M Urbanek, [1,2]M Keller, [1]U Kiechl-Kohlendorfer, [1]E Griesmaier. *[1]Department of Paediatrics IV, Division of Neonatology, Innsbruck Medical University, Innsbruck, Austria; [2]Department of Paediatrics, Children's Hospital Passau, Passau, Germany*

Background Supraphysiologic oxygen concentrations are toxic to the developing brain. Inflammatory processes increase the risk of brain injury. We have previously shown a protective effect of dextromethorphan, a NMDA receptor antagonist and sigma-1 receptor (σ1R) agonist, in an animal model of hyperoxia-induced neonatal brain injury. In adult brain injury, sigma agonists have a proven therapeutic potential.
Aim To assess the highly selective σ1R agonist PRE-084 in a newborn animal model of inflammation-sensitized hyperoxia-induced brain injury.
Methods Rat pups were randomly pre-sensitized with a single intraperitoneal (ip) injection of i) LPS or ii) vehicle on postnatal day 3. On postnatal day 5, pups were ip-injected with i) PRE-084 1μg/g bodyweight or ii) vehicle and were subsequently subjected to either i) hyperoxia (HX, FiO2>0.9) or ii) normoxia (NX, FiO2=0.21) for 24 hours. At the end of exposure, animals were sacrificed and brains were processed for caspase-3 analysis using immunohistochemistry and Western Blotting.
Results A single LPS injection significantly increased the number of activated caspase-3-positive cells in cortical grey matter after hyperoxic exposure, which was reduced by PRE-084 administration (mean number of cells ±SEM; LPS_NX_vehicle 31.26±1.29 vs. LPS_HX_vehicle 38.11±1.13, p<0.01 vs. LPS_HX_PRE-084 33.66±1.54, p<0.05; n=6–7). Western Blot analyses showed a strong reduction in caspase-3 cleavage in PRE-084-treated pups compared to vehicle-injected controls in both pre-sensitized and non-pre-sensitized animals after hyperoxic exposure.
Conclusion PRE-084 reduces inflammation-sensitized hyperoxia-induced injury in the developing rat brain by inhibition of apoptosis. Sigma agonists are a potential therapeutic approach in perinatal brain injury and merit further studies.

1084 ENDOTHELIAL DYSFUNCTION AND PERINATAL MORTALITY OF PRETERM INFANTS EXPOSURED INTRAUTERINE HYPOXIA

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[1]PA Orujova, [2]HA Saadat, [3]H Safikhan, [3]A Saadat, [2]M Sevinj, [4]M Tarana. *[1]Azerbailan Medical University; [2]Neonatology; [3]Azerbaijan Medical University; [4]Maternity Hospital, Baku, Azerbaijan*

Aim To investigate the endothelial dysfunction in preterm newborns with birth weigth over 1500 gr which died in early neonatal period.
Methods For this purpose 30 surviving and 15 dead newborns with birth weight over1500gr were examined and divided in two groups: control group included 30 newborns, main group-15 infants died in early neonatal period. İn all infants were determined antenatal hypoxia by ultrasonography examination. In order to determine endothelial dysfunction sİCAM-1 and sVCAM-1 concentrations were detected by Uscn (Life Science Inc., USA) kits in 1st-3rd and 5th-7 th days. The Student*t*-test and the Mann-Whitney test were used for comparison of parametric and non-parametric parameters.
Results On the 1st–3rd day the levels of the both adhesion molecules were higher in main group than the control group, but on the 5th–7th days of life they were significantly decreased in comparison with either control group and 1st–3rd days parameters. Adhesion molecules concentations in control group were increased in dynamic (p<0.01).
Conclusion The appointment of the level of adhesion molecules may give an opportunity to determine the endothelial dysfunction and may be predict about perinatal outcome.

1085 CARDIOVASCULAR DYSFUNCTION IN INFANTS WITH NEONATAL ENCEPHALOPATHY IN THE 1ST WEEK OF LIFE

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[1,2,3]K Armstrong, [1,2]D Sweetman, [3]O Franklin, [1,2,4]E Molloy. *[1]National Children's Research Centre, National Children's Research Centre; [2]Neonatology, National Maternity Hospital; [3]Paediatric Cardiology, Our Lady's Children's Hospital; [4]Paediatrics, Royal College of Surgeons, Dublin, Ireland*

Background and Aims Perinatal asphyxia may result in transient myocardial ischameia, confirmed by elevated Troponin T levels. Gold standard echocardiographic measures of contractility (ejection and shortening fraction) may not pick up subtle ischaemic changes. Tissue Doppler imaging (TDI) allows assessment of systolic and diastolic function. Used in conjunction with Troponin T TDI may offer superior measure of myocardial contractility.
Methods Term infants with evidence of Neonatal Encephalopathy (NE) underwent echocardiography on Day 1 & 7 of life. Healthy term controls had one echocardiogram on Day 1. Serum Troponin T levels were recorded in infants with NE. Myocardial velocities were obtained using a pulsed wave doppler from an apical four chamber view. Peak systolic (S'), early diastolic (E') and late diastolic (A') velocities were recorded.
Results 17 patients with evidence of NE and 20 term controls were recruited. Mean birthweight (SD) was 3.6 kg (0.9) and gestation 39 (5) weeks. TDI systolic and diastolic velocities increased between Day 1&7 in infants with NE. All day 1 measures in the NE group were less than the controls. There was no significant difference between the shortening/ejection fraction on day 1 between the two groups (NE: 33.7–35.3%; Control: 64.3–67.4%) Troponin levels were significantly elevated on Day 1 compared to Day 7 in NE group (p<0.05) (0.53–0.38ng/ml).
Conclusions TDI measures in infants with NE are less than controls on Day 1. Troponin levels were initially significantly increased providing further evidence of myocardial ischaemia in infants with NE.

1086 SEIZURES ARE ASSOCIATED WITH ALTERED HIPPOCAMPAL DIFFUSION IN NEONATES WITH HYPOXIC-ISCHEMIC ENCEPHALOPATHY

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[1]JG Feenstra, [2]PN Lee, [2]D Xu, [3]SL Bonifacio, [4]DM Ferriero, [2]AJ Barkovich, [4]HC Glass. *[1]University of Groningen, Groningen, The Netherlands; [2]Radiology & Biomedical Imaging; [3]Pediatrics; [4]Neurology & Pediatrics, University of California, San Francisco, CA, USA*

In animal models, neonatal seizures (NS) alter hippocampal development and lead to long-term deficits. Whether NS similarly affect humans is not known. The goal of this study was to assess whether NS are associated with altered hippocampal microstructure in neonates with hypoxic ischemic encephalopathy.

We included 6 neonates with and 27 without seizures. All were treated with therapeutic hypothermia after birth. Neonatal (median 5 days) and 6-month diffusion tensor imaging was used to measure apparent diffusion coefficient (ADC) from regions of interest (ROIs) in the hippocampus, basal ganglia, thalamus and frontal white matter.

ADC was significantly lower on the 6-month scan as compared to the neonatal scan for all ROIs. There were no significant differences in ADC on the early scan when comparing neonates with and without seizures. At 6 months, infants with seizures as neonates had a 6% higher hippocampal ADC (95% confidence interval: 0–11%, p<0.05). There was no significant difference in ADC for the other ROIs.

These preliminary results suggest that NS are associated with altered hippocampal structural development. Because the difference was seen only in the hippocampus, and on follow-up imaging but