contains brain regions that deactivate when a cognitive task is being performed, was identified in the rs-fMRI data using independent component analysis.

**Results** The VPT group showed decreased functional connectivity (with the rest of the DMN) in the cingulate gyrus and increased connectivity in the left hippocampus compared to controls. In the whole sample (VPT and controls) MWF in the CC was negatively correlated with functional connectivity in the hippocampus and positively correlated with functional connectivity in the medial prefrontal cortex (mPFC). Moreover, the correlation between MWF and functional connectivity in the mPFC was stronger in controls than in VPT-born individuals. All analyses used a p≤0.05.

**Conclusions** The degree of myelination of the CC is associated with functional connectivity in the DMN, with altered MWF-functional connectivity relationships displayed in adults born VPT in brain regions underlying important high-order cognitive processes.

**POOR MOTOR OUTCOME AT 2 YEARS OF AGE IS PREDICTED BY ELEVATED LEUKOCYTE COUNT IN INFANTS WITH PERINATAL ASPHYXIA**

DU Sweetman, P Lakatos, EJ Molloy, J Kardasi, M Bango, M Szabó.
1Neonatology, The National Maternity Hospital, Dublin, Ireland; 2First Department of Paediatrics, Semmelweis University, Budapest, Hungary; 3Paediatrics, Royal College of Surgeons in Ireland; 4Neonatology, Our Lady’s Children’s Hospital Crumlin, Dublin, Ireland

**Introduction** An elevated white cell count in term newborns with neonatal encephalopathy (NE) has been associated with increased risk of mortality and neurological disability.

**Aims** To examine the associations between the white blood cell (WBC) indices of severely asphyxiated infants and mortality/neuro-developmental outcome at 2 years.

**Methods** 69 infants with NE were randomized to normothermia or hypothermia as part of the TOBY trial. Serial WBC parameters, (WBC) indices of severely asphyxiated infants and mortality/neuro-developmental outcome at 2 years were compared to the normothermic group.

**Results** There were 46 survivors, 16 non-survivors. 43 infants received hypothermia therapy and the remainder (n=19) kept normothermic. Elevated WBC count and Granulocyte count at 0–8 hours predicted mortality. ROC analysis favours Granulocyte count as the superior predictor of mortality. For each unit increase in WBC count the odds ratio of death increases by 1.076 for the normothermic group (p=0.032) but not for the hypothermic group (p=0.290). High leukocyte counts at 20–28 hours (range 1–27 × 10^9/L) are associated with worsening motor scores (p<0.0001) and with abnormal motor outcome.

**Predictors of Mortality Wald Statistic Exp(B) p-value AUROC p-value**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Wald Statistic</th>
<th>Exp(B)</th>
<th>p-value</th>
<th>AUROC p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC count at 0–8 hours</td>
<td>5.608</td>
<td>1.082</td>
<td>0.018</td>
<td>0.702 0.017</td>
</tr>
<tr>
<td>Granulocyte count at 0–8 hours</td>
<td>4.398</td>
<td>0.899</td>
<td>0.036</td>
<td>0.884 0.006</td>
</tr>
</tbody>
</table>

**Conclusion** Elevated WBC counts increase the risk of mortality in the normothermic group but not in the hypothermic group. Raised leukocyte counts at 20–28 hours are associated with abnormal motor outcome at 2 years. WBC counts may play a future role in a biomarker panel helping to predict outcome following neonatal hypoxic-ischaemia.

**IS THE USE OF PLACENTAL BIOPSY FEASIBLE FOR BIOMARKER ANALYSIS IN NEONATAL ENCEPHALOPATHY?**

AM Looney, LA Kelly, BH Walsh, GB Boylan, S Muttukrishna.
1Department of Paediatrics and Child Health; 2Department of Obstetrics and Gynaecology, University College Cork, Cork, Ireland

**Background/Aim** Encephalopathy following severe neonatal asphyxia is one of the leading causes of morbidity and mortality in term neonates. Therapeutic hypothermia has been shown to improve outcomes in moderate and severe encephalopathy if administered within six hours of birth. Rapid diagnosis of at-risk infants is therefore crucial. To-date, no effective early diagnostic biomarker has been established in blood, urine or CSF. Biomarkers in placental biopsies have been largely overlooked due to the perceived difficulty in obtaining and processing viable samples soon after birth. Our aim was to establish the feasibility of using placental biopsies for biomarker analysis in neonatal encephalopathy (NE).

**Methods** Placental biopsies were collected following elective caesarean sections (controls), stored according to 4 different protocols and snap frozen at 5 different time points after delivery. Immunohistochemical staining, total RNA and protein concentrations were used to analyse tissue degradation over time. Biopsies from infants with NA were also collected in a pilot study and our biopsy methodology applied. Potential biomarker expression levels were then determined using enzyme immune assays.

**Results** Our timeline study from 4 control placentas revealed that gene and protein expression results together with immunohistochemical findings showed limited deterioration on tissue viability up to 90 minutes after delivery. In 10 asphyxia placentas the expression profiles of four specific biomarkers (Activin-A, sFlt-1, IL-6 and Placental Growth Factor) were determined.

**ARE VERY PRETERM BABIES WITH INTRAVENTRICULAR HAEOMORRHAGE AT RISK FOR THYROID DYSFUNCTION?**

A Gupta, S Gupta.
Department of Paediatrics, University Hospital of North Tees, Stockton-on-Tees, UK

**Background and Aims** Very preterm babies (<32 weeks/<1500g) are prone for intraventricular haemorrhage (IVH) and are routinely screened in first and sixth week of life. There is however limited data whether presence of IVH in preterm babies affects endocrine functions.

**Methods** • Preterm babies born <32 weeks/<1500 kg and admitted to neonatal unit on the first day of life were included into the study which was conducted in neonatal unit of the University Hospital of North Tees from September 2010 to December 2011. TSH levels were measured in those babies on the first and six week of life.

**Results** • There was significant difference in mean TSH values between babies with and without IVH in 1st week (0.85 vs 1.37; p=0.026).

**Conclusions** From our data we conclude that presence of IVH adversely affects the thyroid function in very preterm babies. There is need for bigger studies in this area.
MMP-9) revealed changes in protein expression between asphyxia and control cases.

**Conclusion** Placental biopsies collected at up to 90 minutes after delivery show stable gene and protein expression and may provide useful early biomarkers in NE.

---

1063 CEREBELLAR AND THALAMIC GROWTH IN PRETERM INFANTS IN RELATION TO BIRTH WEIGHT (BW)

**Background** Reduced cerebellar/thalamic growth affects neurodevelopment. The exact mechanisms are unknown.

**Aims** To compare cerebellar/thalamic growth of preterms in relation to BW and weight at 36 weeks' corrected (W36).

**Methods** Retrospective matched cohort-analysis: 4 BW groups matched for maternal smoking, chorioamnionitis, antenatal steroids, delivery mode, multiples and gender.

**Exclusions** growth restriction, congenital anomalies.

**Study Variables (table1)** gestational age (GA), BW, W36, head circumference at birth/36 weeks (HC/HC36), transverse cerebellar/thalamic diameter at birth/36 weeks (TCD/TTD and TCD36/TTD36).

**Confounding variables** ventilation days (V), oxygen requirement 36 weeks' corrected (O2), postnatal steroids (FS), NEC, days antibiotic treatment (ABX), days parenteral nutrition (TPN), phototherapy, IVH, PVL.

**Statistics** median (quartiles, 25th/75th), Friedman-/Cochran-test.

**Results** Cerebellar growth is more resilient than thalamus or cerebrum to the negative effects of established risk factors for poor neurodevelopmental outcome.

---

1064 NEUROLOGICAL INVOLVEMENT OF ENTEROVIRUS INFECTION IN YOUNG INFANTS WITH SEPSIS-LIKE ILLNESS

**Introduction** Enterovirus (EV) infection is common in young infants. Amongst those requiring intensive care seizures and cerebral white matter abnormalities with serious neurologic sequelae have been reported. We questioned whether similar neurologic features occur in less seriously ill infants with EV infection.

**Methods** From August 2011 onward we included children under 90 days of age, admitted to a medium care unit with sepsis-like illness due to EV infection but not requiring intensive care. Cerebral ultrasound imaging was performed during hospital stay, cerebral MRI and hearing screening 4–6 weeks post-infection. During all visits neurological examination was performed and developmental milestones determined.

**Results** Preliminary results of the first 13 infants included are presented. Seven had positive EV PCR in CSF and serum, 6 tested positive in serum only. None showed seizures or abnormal neurological examination at admission. Cerebral ultrasound was performed in 12/13 infants and showed no abnormalities. Cerebral MRI was performed in 10/13 infants; one showed diffuse white matter abnormalities in the frontal and occipital lobe. Hearing screening was normal in all infants. Neurological examination 4–6 weeks after infection showed slight hypotonia of the lower extremities in one infant. At 6 months of age all infants had normal neurologic examination.

**Conclusion** At 4–6 weeks following EV infection cerebral white matter abnormalities were found on MRI in one infant, whereas a slight hypotonia of the legs was found in another. At 6 months of age neurological examinations were normal in all infants. The long term implications of our findings are unclear.

---

1065 REFERENCE VALUES OF ULTRASOUND BRAIN MEASUREMENTS IN PRETERM NEWBORN INFANTS

**Background and Aims** Ultrasonography is noninvasive and commonly used for neuroimaging in premature newborns. Studies on brain measurement techniques and reference values of brain diameters are lacking. This paper aimed at

1. determining average diameters of cerebral ventricles, brain and cerebellum in preterm infants;
2. describing discrepancies between left and right sides, and between type of transducers used;
3. assessing possible relationships between diameters measured and gestational age, head circumference, birth length, birth weight, and gender.

**Methods** 132 newborn infants were enrolled and each subject had 34 diameters measured and 6 ratios calculated. Area of cavum septum pellucidum (ACSP), ventricular index (VI), ventricular width (VW), brain width (BW), third ventricle width (3VW), frontal horn width (FHW) were assessed in coronal plane. Evans (ER) and Johnson (JR) ratios were calculated. Midbody of lateral ventricle (MLV) and thalamo-occipital distance (TOD) were studied in parasagittal...