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 $p \leq 0.05$.

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.

1060 POOR MOTOR OUTCOME AT 2 YEARS OF AGE IS PREDICTED BY ELEVATED LEUKOCYTE COUNT IN INFANTS WITH PERINATAL ASPHYXIA

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[1]DU Sweetman, [2]P Lakatos, [1,3,4]EJ Molloy, [2]J Kardasi, [2]M Bango, [2]M Szabó. *[1]Neonatology, The National Maternity Hospital, Dublin, Ireland; [2]First Department of Paediatrics, Semmelweis University, Budapest, Hungary; [3]Paediatrics, Royal College of Surgeons in Ireland; [4]Neonatology, 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/neurodevelopmental outcome at 2 years.

Methods 69 infants with NE were randomized to normothermia or hypothermia as part of the TOBY trial. Serial WBC parameters, clinical outcome and 2-year developmental assessments were evaluated in 62 infants.

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 leukoycte counts at 20–28 hours (range $1–27 \times 10^9$/L) are associated with worsening motor scores (p<0.0001) and with abnormal motor outcome.

Abstract 1060 Table 1 WBC count predictors of mortality in NE

Predictors of Mortality	Wald Statistic	Exp(B)	p-value	AUROC	p-value
WBC count at 0–8 hours	5.608	1.082	0.018	0.702	0.017
Granulocyte count at 0–8 hours	4.398	0.889	0.036	0.884	0.006

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.

1061 ARE VERY PRETERM BABIES WITH INTRAVENTRICULAR HAEMORRHAGE AT RISK FOR THYROID DYSFUNCTION?

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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.

We aimed to study correlation between intraventricular haemorrhage and thyroid function in very preterm babies.

Methods

- Preterm babies born < 32 weeks/< 1500 kg and admitted to tertiary care neonatal unit between 1st January 2009 and 31st December 2010 to were identified.
- The results of the cranial scans and serum TSH were obtained from radiology records and newborn screening department respectively.
- The data was collated and analysed to study any co-relation between IVH and thyroid dysfunction. Data analysed using SPSS®version 19.

Results

- During the study period 176 very preterm babies were admitted to the neonatal unit. Of these 27% (82% IVH) and 22.5% (50% IVH) had abnormal cranial ultrasound scans at 1st and 6th week respectively.
- The mean TSH for total cohort at 1st and 6th week was 1.25 and 1.51 mIU/L respectively. At 1st and 6th week, the mean TSH for babies with abnormal scans was 1.07 and 2.2 mIU/L respectively.
- There was significant difference in mean TSH values between babies with and without IVH in 1st week (0.85 vs.1.37; p=.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.

1062 IS THE USE OF PLACENTAL BIOPSY FEASIBLE FOR BIOMARKER ANALYSIS IN NEONATAL ENCEPHALOPATHY?

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[1,2]AM Looney, [2]LA Kelly, [1]BH Walsh, [1]GB Boylan, [2]S Muttukrishna. *[1]Department of Paediatrics and Child Health; [2]Department 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

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)

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[1]E Andrew, [1]J Siu, [2]VJ Pelling, [3]H Rabe, [2]P Amess, [2]JR Fernandez Alvarez. *[1]Brighton and Sussex Medical School; [2]Brighton and Sussex University Hospitals NHS Trust; [3]Brighton and Sussex University Hospitals, Brighton and Sussex Medical School, Brighton, UK*

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 (O_2), postnatal steroids (PS), NEC, days antibiotic treatment (ABX), days parenteral nutrition (TPN), phototherapy, IVH, PVL.

Statistics median (quartiles,25^{th}/75^{th}), Friedman-/Cochran-Test.

There was a statistically significant difference in V, PS, O_2, ABX, TPN, but not NEC, phototherapy, IVH, PVL.

Conclusion 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

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[1]EP De Jong, [2]EPM Van Elzakker, [3]H Holscher, [4]FJ Walther, [1]F Brus. *[1]Juliana Children's Hospital; [2]Medical Microbiology; [3]Radiology, HAGA Hospital, The Hague; [4]Paediatrics, Division of Neonatology, Leiden University Medical Center, Leiden, The Netherlands*

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 hypertonia 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 hypertonia 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

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[1]JA Wroblewska, [2]J Surmik, [1]I Maruniak-Chudek, [3]J Swietlinski. *[1]Neonatal Intensive and Special Care, Silesian Medical University; [2]Neonatal Intensive and Special Care, Upper Silesian Centre for Child Health, Katowice; [3]Neonatal Intensive Care Unit, City Hospital, Ruda Slaska, Poland*

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

Abstract 1063 Table 1

	<1000g(N=14)	1000–1499g(N=17)	1500–2499g(N=8)	≥2500g(N=46)	p-value
GA(weeks)	26(25–27)	30(28–31)	31(31–32)	39(38–40)	<0,001
BW(g)	762(585–882)	1200(1130–1390)	1670(1573–1765)	3345(2814–3668)	<0,001
HC(cm)	23.5(22.0–24,5)	27(26.0–27,3)	29.2(28.3–30,1)	34.2(33.5–35,5)	<0,001
TCD(cm)	2.4(2.3–2.7)	3.2(2.7–3.4)	2.9(2.6–3.5)	4.0(3.6–4.3)	0.002
TTD(cm)	1.8(1.7–2.0)	2.2(2.0–2,3)	2.4(2.3–2,4)	2.8(2.6–2,9)	<0,001
W36(g)	1702(1528–1850)	2050(1800–2200)	2250(2018–2350)	Not applicable	<0,001
HC36(cm)	29.8(28.4–31,6)	32(31.0–32,6)	32.3(30.3–32,8)	Not applicable	0,001
TCD36(cm)	3.3(3.2–3.7)	3.6(3.1–4.3)	4.0(3.5–4.4)	Not applicable	0.072
TTD36(cm)	2.4(2.3–2,6)	2.4(2.3–2,5)	2.7(2.6–2,9)	Not applicable	0,028