All medical records and imaging studies were reviewed.

Results Number of Deliveries over the 5-year study period was 25443 of which 4100 (16%) were un-booked. Dilated cistern magna was diagnosed in 26 (0.12%) fetal scans (15 male and 11 females). Post natal scans were done in 20/26 (77%) and not done in 6/26 (23%) of cases.

Of the 20 post natal scans done 12 (60%) were normal and 8 (40%) were abnormal. The following abnormalities were detected: 4 (50%) dandy walker complex, 2 (25%) corpus collasum dysgenesis and 2 (25%) cerebellar hypoplasia. Neuro-developmental assessment was reported as normal in 60% of the isolated mega cistern magna patients.

Conclusion The association of mega cisterna magna with major CNS anomalies is high in our population. Post natal neuroimaging confirmation of all abnormal fetal sonography is required. Long term neurocognative assessment and follow up is essential for this population.

1057 SPECTRUM OF CRANIAL ULTRASOUND FINDINGS IN NEWBORNS UNDER 26 WEEKS GESTATION OVER 10 YEAR PERIOD IN A TERTIARY NEONATAL UNIT

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Background and Aims Cranial ultrasonography is an integral part of routine neonatal screening in extreme preterm neonates. To audit the spectrum of cranial ultrasound scan findings in preterms less than 26+0 weeks gestation.

Methods We reviewed all cranial ultrasound findings performed in babies less than 26+0 weeks gestation between 1999–2008. Demographic data was collected using a proforma. Information regarding cranial ultrasound scans on day 1–4, day 7 and day 28 of life for live born babies admitted to the neonatal unit was collected.

Results The results are tabulated in the tables attached. Table 1 shows the demographic details and table 2 shows the spectrum of cranial ultrasound findings.

Abstract 1057 Table 1 Demographic details

Gestation (weeks)	Number of babies	Median birth weight(grams)	Apgar at 1 minute(median)	Apgar at 5 minutes(median)
23 – 23+6	11	630	3	7
24 – 24+6	50	660	4	8
25 – 25+6	69	734	5	8

Conclusion Extremely preterm babies (23 and 24 weeks gestation) had a higher incidence of abnormal cranial ultrasound scans compared to those over 25+0 weeks gestation. This is associated with a high risk of morbidity and mortality. This information is important when counselling parents and for prognosticating outcomes.

1058 NEW SEGMENTATION METHOD SHOWS EFFECTS OF PREMATURITY ON CEREBRAL TISSUE VOLUMES AT TERM

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Background and Aim Longitudinal studies show that premature birth increases infants' risk for mental and motor development deficits. Our aim was to investigate the influence of prematurity on cerebral tissue volumes at term obtained with a novel fully automatic segmentation method.

Methods 62 preterm infants (GA 27.7±1.3wks) and 15 term-born infants (GA 40±1.1wks) were scanned at term-equivalent age (GA 40.5±1.5wks). T1 and T2 MR images were segmented with a novel atlas-free automatic method based on morphological constraints. Each brain was separated into the two hemispheres, cortical and subcortical gray matter, myelinated and unmyelinated white matter, brainstem, cerebellum and CSF.

Results Linear regression models were fitted to study the dependency of tissue volumes on GA at birth, GA at scan and intracranial volume. Models show significant dependence on GA at birth for cortical gray matter (Beta=0.270, P=0.000, R^2=0.818), unmyelinated white matter (Beta=0.196, P=0.03, R^2=0.575), cerebellum (Beta=0.348, P=0.000, R^2=0.648) and CSF (Beta= –0.329, P=0.000, R^2=0.708).

Wilcoxon Signed Ranks tests showed significantly larger unmyelinated white matter volumes in the right hemisphere compared to the left hemisphere (Z= –4.826, P=0.000), and significantly larger total volumes of the right hemisphere compared to the left hemisphere (Z= –3.486, P=0.000).

Conclusions Reliable volume assessments were derived from the new automatic segmentation. CSF volumes at term increased with lower GA at birth, while cortical gray matter, unmyelinated white matter and cerebellum volumes at term increased with GA at birth, suggesting impaired growth of these tissues associated with prematurity. Cerebral asymmetry was present at term for both preterm and term infants.

1059 MYELIN IS DIFFERENTIALLY ASSOCIATED WITH RESTING STATE FUNCTIONAL CONNECTIVITY IN ADULTS WHO WERE BORN VERY PRETERM AND CONTROLS

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Background and Aims Diffuse white matter injury is the most common form of brain injury following very preterm (VPT) birth. This may reflect altered myelination, which could affect both neurodevelopment and neuronal communication. We investigated whether myelin in the corpus callosum (CC) was associated with functional connectivity; and if these associations differed between young adults born VPT and controls.

Methods 9 VPT-born adults and 13 controls (age 26–28 years) underwent resting state functional MRI (rs-fMRI), diffusion MRI and mcDESPOT, a novel neuroimaging method which provides an *in vivo* estimate of myelin water fraction (MWF). MWF was calculated along the CC. The default mode network (DMN), which

Abstract 1057 Table 2 Spectrum of cranial ultrasound findings

Gestation	Day 1–4 Normal	Day 1–4 Abnormal	No results available/died	Day 7 Normal	Day 7 Abnormal	No results available/died	Day 28 Normal	Day 28 Abnormal	No results available/ lost to follow up/died
23 – 23+6	6	5(45%)	0	4	7(63%)	0	3	7(63%)	1
24 – 24+6	24	19(38%)	7	13	23(46%)	14	15	14(28%)	23
25 – 25+6	44	17(24.6%)	8	39	18(26%)	12	28	12(17.3%)	29

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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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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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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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