[figure]

Conclusions: Accelerated maturation of cerebral function seems to be associated with long-term cognitive and behavioral deficits without overt effects on motor development in preterm infants who were neurologically normal in the neonatal period.

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CORRELATION BETWEEN ULTRASOUND TEXTURE ANALYSIS OF THE CEREBELLUM AND STANDARD DIAGNOSIS OF WHITE MATTER DAMAGE IN PRETERM NEONATES

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Background and aims: Ultrasound diagnosis of white matter damage (WMD) is still subject to variability, and methods based on quantitative ultrasound analysis are under investigation to improve diagnostic accuracy. The correlation between WMD and cerebellar changes in term and one-year old infants has previously been described. We tested the hypothesis that a semiautomated

method for ultrasound texture analysis (AQUA) could detect patterns to predict the standard clinical diagnosis of WMD in preterm neonates.

Methods: A cohort of 40 very preterm infants (< 32 weeks) underwent 2 cranial US scans within the first and after 2 weeks of life. WMD was diagnosed using standard criteria. Texture analysis was run in the cerebellum, manually delineated in a coronal plane through the anterior fontanelle. A classification algorithm based on texture coefficients was used to correlate to clinical diagnosis and its ability to predict in the first scan a later diagnosis of WMD was then evaluated.

Results: Median gestational age was 29+4 weeks (26+0-31+6). WMD was diagnosed in 10/40 infants. Cerebellar texture analysis in the first scan could identify cases later diagnosed with PVL with a sensitivity of 100% and an accuracy of 95%, after adjustment for gestational age and birth weight.

Conclusions: The cerebellum might contain useful information that improves the prediction of standard white matter damage diagnosis. These preliminary data support further investigation of the role of this brain structure in the neonatal diagnosis of WMD by means of semi-automated quantitative ultrasound analysis.

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MRI OF THE BRAIN OF TWINS WITH TWIN TWIN TRANSFUSION SYNDROME. (TTTS)

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Introduction: Perinatal mortality and morbidity rates are higher in twins than in singletons. Monochorionic twins have a high risk of low birth weight, preterm delivery and neurologic morbidity. TTTS occurs as a serious complication in 10 to 15% of monochorionic diamniotic (MCDA) pregnancies. The assessment of term corrected MRI brain has not been investigated to the best of our knowledge in this specific area to date.

Objective: The aim of this study was to evaluate term corrected MRI brain as a surrogate short-term marker for neonatal outcome of twins with TTTS.

Study Design: We conducted a prospective trial in the Rotunda hospital which had ethical approval. We

obtained informed consent from parents of infants in 3 groups: 1: Twin pregnancies that underwent intrauterine laser. 2: MCDA twins who did not meet the clinical criteria for TTTS. 3: Dichorionic diamniotic (DCDA) twins. The MRIs took place at term using a Siemens 1.5 Tesla MRI scanner. T1, T2, ADC and diffusion images were acquired.

Results: 10 sets of twins and 1 set of triplets have consented. (n=23). 7 sets have reached term and have had an MRI (n=14). In our cohort gestation ranged from 25 weeks to 34 weeks. To date 2 MRIs have been reported as abnormal. 1 sibling in the laser group and 1 sibling in the DCDA group.

Conclusion: This group of infants and their MRI findings represent a spectrum of findings in multiple births. Follow up at 2 years with Bayleys is planned and will ascertain any long-term correlation.

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ELEVATED LEUKOCYTE COUNT PREDICTS MORTALITY IN INFANTS WITH NEONATAL ENCEPHALOPATHY

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Background and Aims: An elevated peripheral leukocyte count has been associated with increased risk of neurological disability in asphyxiated term neonates. We aimed to examine the alternations in routine haematological indices in infants with severe asphyxia

Methods: 70 infants referred to the tertiary referral centre of Semmelweis University Budapest 1st Dept of Pediatrics with asphyxial encephalopathy and were randomized to either normothermia or hypothermia. Their serial full blood count parameters, clinical outcome and Bayleys assessments were evaluated.

Results: There were 51 survivors and 19 non-survivors in this cohort. 60 infants received hypothermia therapy and the remainder were kept normothermic. There was a significant difference in the white cell count (WCC) in the first 8 hours of life between survivors and non-survivors (23+/-9 v 31+/-11, respectively; p value=0.012). In addition the associated neutrophils were altered (Survivors: 72+/-12 v non-survivors: 55+/-5%).

However CRP was not significantly different. Here was no correlation between Bayley score and initial WCC in surviving infants.

Conclusions: Altered inflammatory markers may indicate infants at higher risk of death. Further exploration of early inflammatory markers may be useful in early decisions about the use of hypothermia.

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VLBW INFANTS: ACCELERATED COGNITIVE DEVELOPMENT AT TWO YEARS

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There is a paucity of literature concentrating on the VLBW infant whose development is accelerated. This study addresses a cohort of Infants BW $\leq$ 1500g who had high Bayley Mental Developmental scores ($\geq$ 115).

Methods: VLBW $\leq$ 1500g born in a tertiary 3 Unit were followed up at 2 years corrected age. The Bayley Scales of Infant Development - 11 were used to measure Mental, Psychomotor and Emotional development during the period 1997- 2004.

Results: Of 460 infants assessed 73 (15.7%) infants demonstrated Accelerated Mental Performance (MDI $\geq$ 115). 70% were girls; 30% boys. Linguistic acquisition was a strong feature. Birthweight and Gestational age did not influence outcome. A subtask analysis was performed. 25 tasks consisting of cognitive, language and visual spatial skills were identified. Of these 25 tasks, 56% (14 tasks) of the Accelerated group demonstrated >90% success whereas only 8% (2 tasks) of the Normal Outcome group demonstrated >90% success. Tasks that were most discriminatory in showing a difference between the Accelerated group and the Normal Outcome group were shape discrimination, use of 3 word and contingent utterances, picture naming, picture discrimination, and tower building. Attention skills, task planning and prompt performance were strong features in the Accelerated group.

Conclusion: 16% of our cohort of VLBW infants achieved accelerated performance on the Bayley scale when tested at 2 years. We identified specific tasks that discriminated the performance of the Accelerated group from the Normal group and noted favourable behavioural characteristics that were integral to higher level of task performance.