PS-114 PROGNOSTIC PERFORMANCE OF PROTON MAGNETIC RESONANCE SPECTROSCOPY (HMRS) METABOLITE RATIOS IN THE FIRST 96 HOURS OF LIFE IN ASPHYXIATED NEONATES

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Background and aims Neonatal hypoxic-ischaemic encephalopathy (HIE) can lead to neurodevelopmental impairment, raising a need for early prognostic tools to guide therapy. The prognostic value of HMRS performed between 5–30 days of life has been extensively studied, although few studies focus on earlier periods. Therefore, we investigated the prognostic performance of HMRS during the first 96 h of life.
Methods 55 consecutive hypothermia-treated HIE neonates were examined by HMRS at three echo-times (TE = 35 ms, 144 ms, 288 ms) between 6–96 h of age, depending of clinical stability. Patients were divided into favourable (n = 38) and unfavourable (n = 17) outcome groups based on Bayley II MDI and PDI scores (≥70 vs <70 or death, respectively) assessed at 18–26 months of age. Associations between 36 routinely measured metabolite ratios (MROs) and outcome were studied. The prognostic performance of MROs was evaluated by ROC analysis. Time-dependent changes of MROs in whole patient population were also assessed.
Results 6 MROs showed significant difference between outcome groups after correction for multiple testing ($p < 0.0014$). ROC analysis revealed that Myo-inositol/N-Acetyl-Aspartate (TE = 35) gives best prediction for outcome with 85.71% sensitivity and 91.30% specificity. Assessment of time-dependency showed that 4 of 6 MROs stay constant during the first 96 h of life, all containing Myo-inositol.
Conclusions Our findings suggest that during the first 96 h of life HMRS could be a useful early prognostic tool in predicting the outcome of asphyxiated neonates. Myo-inositol/N-Acetyl-Aspartate ratio was found to be the best and time-independent predictor.

PS-115 1H-NMR MEASURMENT OF CORD GLYCEROL SUCCINATE PREDICTS SEVERE ENCEPHALOPATHY AND DEATH IN NEONATAL HYPOXIC-ISCHAEMIC ENCEPHALOPATHY

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Background and aims The outcome of infants with severe hypoxic-ischaemic encephalopathy (HIE) remains extremely poor. Early identification of these infants could improve patient management and direct care. Our aim was to correlate the metabolomic profile of umbilical cord blood (UCB) with outcome in neonatal HIE.
Methods Full term infants with perinatal asphyxia and healthy matched controls were recruited from 2009 to 2011. All had UCB biobanked at -80°C within 3 h of birth and multichannel electroencephalogram (EEG) recorded in the first 24 h of life. The metabolite profile of UCB was analysed using nuclear magnetic resonance (NMR) spectroscopy. Infant outcome was assessed using the Bayley Scales of Infant and Toddler development at 3 years.
Results The UCB metabolomic profile of 118 infants was described; 59 healthy controls, 34 perinatal asphyxia (no HIE) and 25 HIE defined by Sarnat score and EEG (13 mild, 6 moderate, 6 severe). Of the 6 cases of severe HIE, at 3 years; 4 have died, 1 survived with severe dyskinetic cerebral palsy and 1 had a normal outcome. A characteristic pattern of raised glycerol + succinate occurred in those infants with severe encephalopathy and very low voltage EEG ($R^2 = 0.49$, $p < 0.001$).
Conclusion Alterations in glycerol and succinate at birth reflect critical energy failure in infants with severe neuronal injury. This measurement at birth could help clinicians to identify infants who will not benefit from standard neuroprotection and may need experimental intervention, or limitation of care.

PS-116 WITHDRAWN

PS-117 PRETERM CEREBRAL MICROCIRCULATION ASSESSED WITH COLOUR DOPPLER: A PILOT STUDY

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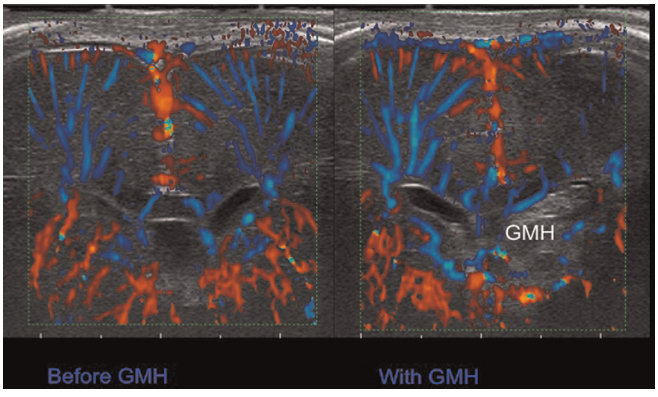
Background and aims Pilot study to explore feasibility of a colour Doppler technique for monitoring cerebral perfusion at the level of microvessels.
Methods Between March 1st, 2011, and January 30th, 2013, all admitted infants born before 29 weeks of gestation were eligible for Doppler imaging. Perfusion images were acquired in a standard coronal plane. Image quality was assessed by two authors (MR, PG). The region of interest (ROI) was manually selected. A segmentation tool was developed to separate colour data from the greyscale 2D images, leading to a percentage and number of colour pixels in the image (Doppler colour index; DCI). Intra- and interobserver agreement was analysed.
Results Intra- and interobserver agreement for placement of ROIs was good (bias -0.24 resp. -0.74 percentage points). Colour Doppler was able to depict microvessels in cortex, white matter and deep grey matter. The median DCI in a region of cortex-white matter was 7.8% with a wide range (1.4%-25.6%). There was no significant difference between the left and right hemisphere (Mann-Whitney U, P-value 0.61). Clinically relevant observations were tabulated, e.g. distant effect of GMH on regional perfusion.



Abstract PS-117 Figure 1