in neonates is 35 mg/kg/24 hrs however safe brain levels are unknown.

Objective To determine the PG levels in MRS of infants with NE.

Design/methods MRS between July 2010 and August 2013 were reviewed in infants with NE (PRESS sequence TE: 288ms) All MRS spectra were reviewed by an MR Physicist. Cases with an observable doublet at 1.1 ppm were reprocessed with Tarquin V4.3.2 using a simulated basis set the included PG and referenced to unsurpassed water signal to obtain institutional units of concentration.

Results 29 infants with NE. MRI was performed at mean age of 120 hrs (35–197 hrs) Diagnosis HIE (27), Congenital lactic acidosis (1) GBS meningitis (1) MCA infarction (1) PG was present in 24% of infants (n = 7). The mean level on MRS was 10.76 mM (2.11–26.48).

All infants with PG peaks received 40mg/kg PhB, and 18 mg/kg Ph and 6/7 received Clonazepam. No PG group required less anticonvulsants (13.6% no treatment, 63% PhB, 23% PhB and Ph).

Conclusions PG is detected on MRS in NE infants.

The level may correlate with underlying diagnosis. PG accumulation may have clinical implications which need to be further investigated. Additionally PG must be correctly differentiated from lactate on MRS.

PO-0411 QUANTITVE AMPLITUDE INTEGRATED ELECTROENCEPHALOGRAPHY ANALYSIS IN VERY LOW BIRTH WEIGHT INFANTS ON FIRST DAYS OF LIFE

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10.1136/archdischild-2014-307384.1056

Background and aims Amplitude integrated electroencephalography (aEEG) is a tool for continuous brain function monitoring in NICU patients. The aEEG classification related to pathology and visually assessed by examiners is fully described. Nevertheless the quantitative analysis of these signal is still not well defined.

The aim was to check if a quantitative analysis of an aEEG can be a useful tool in early diagnosis of morbidities such as intraventricular haemorrhage (IVH), periventricular leukomalacia (PVL) and hemodynamically significant persistent ductus arteriosus (PDA).

Methods Very low birthweight newborns admitted to NICU in a first day of life were included. On 1st, 3rd and 10th day of life patients had been monitored with aEEG for 2 h. A 1 h of stable recording was analysed. The aEEG power was analysed in 3 ranges (below 5uV, between 5uV and 40uV and above 40 uV). The study group consisted of sick newborns with either IVH (III and IV grade), PVL or PDA (with surgical closure of PDA). The control group were children without these abnormalities. Groups were cross-matched according to gestational age. U Mann-Whitney test had been used.

Results There were 12 newborns in each: study and control group. There were 15 samples of an aEEG power from each patient. The aEEG power for children in study group was significantly lower on 1st day of live for a range above 40uV ($p < 0{,}000000$). On a 3rd day the aEEG power was significantly lower in a study group for range below 5uV ($p < 0{,}000000$) and higher for ranges between 5uV and 40uV and above 40uV ($p < 0{,}000000$). On a 10th day the power above 40uV was significantly lower in a study group ($p = 0{,}000006$).

Conclusion Quantitive analysis of an aEEG could be a useful method of identifying high risk neonates on a first and 10th day of live. Diminished power above 40uV reflects decreased CNS activity described as electrical bursts.

PO-0412 RELATIONSHIP BETWEEN CEREBRAL AND SYSTEMIC PERFUSION, AND SHORT-TERM OUTCOMES IN INFANTS WITH PERINATAL ASPHYXIA

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10.1136/archdischild-2014-307384.1057

Background and aims The effects of haemodynamic changes on cerebral and systemic perfusion in infants with perinatal asphyxia are not well understood. We investigated the relationship between cerebral and systemic perfusion, and short-term outcome in infants with asphyxia.

Methods Ten infants (gestation age >35 weeks) with asphyxia (Apgar score <7 at 1 min) were divided into 2 groups: those with hypoxic-ischaemic encephalopathy (HIE; HIE group, n = 4) and those without HIE (non-HIE group, n = 6). Cerebral tissue oxygenation index (TOI) and cerebral fractional tissue oxygen extraction (FTOE) were measured by near-infrared spectroscopy (NIRS) at 12, 24, 48, and 72 h after birth. Superior vena cava (SVC) flow and left ventricular cardiac output (LVCO) were simultaneously measured by echocardiography.

Results TOI was significantly higher and FTOE was significantly lower in the HIE group (n = 4) than in the non-HIE group (n = 6) at all measurement time points. Although SVC flow and LVCO were not significantly different between the 2 groups, they were consistently higher in the HIE group than in the non-HIE group at all measurement time points. We found a positive correlation between SVC flow and LVCO in both groups, and between SVC flow and TOI in the non-HIE group.

Conclusions Combined bedside monitoring of TOI and FTOE by NIRS and SVC flow may be useful for evaluating secondary energy failure and disrupted regulation of brain circulation in infants with asphyxia.

PO-0413 TRIGEMINAL ODOURS RELEASED BY HEALTHCARE PRODUCTS ACTIVATE OLFACTORY AND PAIN CORTICAL AREAS IN PRETERM AND FULL TERM NEWBORNS

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10.1136/archdischild-2014-307384.1058

Background/aim Hospitalised newborns are highly exposed to nosocomial odorous substances (OS) triggering possibly the intranasal trigeminal subsystem. Irritation of the nasal mucosa can induce pain and activations in pain processing areas in adults We aimed to evaluate cortical activation in trigeminal/olfactory and pain areas following OS exposure in newborns.

Methods Forty-four newborns (17 full-terms, 12 preterms at term PMA and 15 preterms <33 weeks PMA when tested) were

exposed in controlled conditions (silent room, active sleep, randomised order) to three odours presented on a Q-tips:

– water (control);

– a hand rub (DES60®) diluted to match the odour's intensity released by hands;

– an adhesive remover (Convacare®).

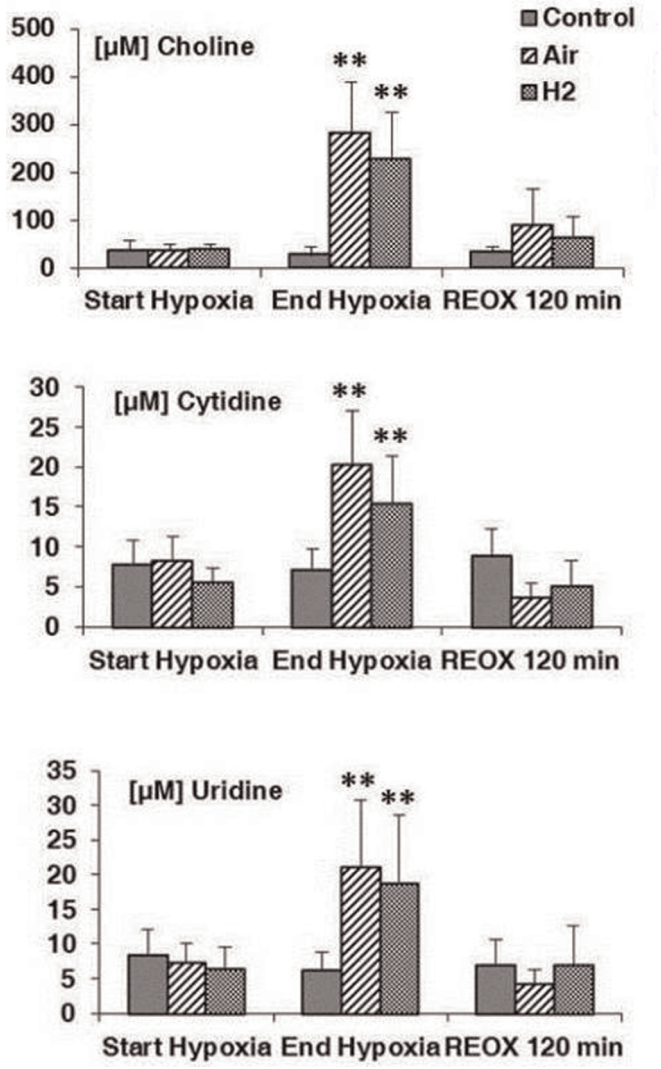
We recorded bilaterally cortical activation in orbito-frontal gyri (OFG), prefrontal (PFC) and somatosensory (S1 and S2) cortices during 40s (10s-baseline, 10s-presentation, 20s-post-stimuli) by multichannel-NIRS. HbO2 changes were analysed from baseline (ANOVA) and by subgroups (Kruskall-Wallis).

Results In the whole population, we observed:

– no activations for water.

– cortical activations (HbO_2 increase) for DES60® ($p < 0.001$), unilaterally in OFG, PFC, and bilaterally in S1 and S2; whereas only in S1 (unilaterally) for Convacare® ($p < 0.001$).

We noticed significant profiles of response for all infant's subgroups, in at least one olfactory and one pain processing areas. The average magnitude of HbO_2 increase from baseline was higher in full-terms vs both subgroups of preterms: 8.5(2.8–12.6) µmol/l vs 5.9(2.6–10.4) and 5.7(1.8–9.2) µmol/l for DES60® ($p < 0.001$).



Abstract PO-0414 Figure 1 Choline, cytidine and uridine levels before and after hypoxia as well as after resuscitation

Conclusion Full-term and preterm newborns can perceive OS at a cortical level. Exposure to OS can activate trigeminal/olfactory and pain processing areas and may induce discomfort/pain in newborns.

PO-0414 PLASMA METABOLOME IN A NEWBORN PIGLET MODEL FOR ASPHYXIA AND RESUSCITATION

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10.1136/archdischild-2014-307384.1059

Background and aims Post-asphyxia resuscitation with air improves survival. We aimed to find reliable biomarkers of brain injury secondary to hypoxia/ischemia in plasma in a newborn piglet model for asphyxia.

Methods Hypoxia was introduced to newborn piglets (standardised model). Plasma metabolomic profiles reflecting the effects of asphyxia and resuscitation were studied, and changes in target metabolites of the Kennedy pathway were analysed by LC-MS.

Results A set of metabolites reflecting metabolic changes after asphyxia and resuscitation was identified. Increased levels of choline, cytidine and uridine (Kennedy pathway) during hypoxia were observed (see Figure 1). No differences were found between resuscitation using air and air+2.1% H_2.

Conclusions Untargeted metabolomics enabled the monitorization of changes occurring during asphyxia and resuscitation on a molecular level. A set of candidate biomarkers was identified. In accordance to previous results, alterations in the Kennedy pathway are reported. The performance of candidate biomarkers for clinical grading will be evaluated in further studies.

Acknowledgments JK and JE acknowledge Sara Borrell grants CD11/00154 and CD12/00667. MV acknowledges the FISPI11/0313 and EC11–246 grant. The Laerdal Foundation (Norway) supported this study.

PO-0415 CORPUS CALLOSUM SIZE AS A PREDICTOR OF VISUAL PROBLEMS AMONG 4-YEAR-OLD VERY LOW BIRTH WEIGHT CHILDREN

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10.1136/archdischild-2014-307384.1060

Background Correlation between corpus callosum (CC) size and motor performance in prematurely born children has been described. It is speculated that the organisation of CC can be associated with visual acuity in preterm children.

Aim To assess the relation between CC size and vision impairment, results of Frostig test of visual perception and Visual evoked potentials (VEP) in a group of VLBW children.

Methods 40 children born with a mean birthweight of 1023g (SD 230g) were evaluated at the mean age of 4 years (range 3.7–4.3). The children were examined for clinical signs of vision impairment and were subjected to Frostig test. VEP was recorded after checkerboard pattern and flash stimulation.