

3 had significantly lower day 0 PI values compared to Group 1 and 2 ( $p=0.008$ ). PI values of Group 3 increased after ibuprofen treatment and became similar to Group 1 and 2 after PDA closure on the post-natal days 2 and 3.

**Conclusion** PI values of infants with hemodynamically significant PDA were lower at postnatal day 0 and with ibuprofen treatment; PI values increased to levels of infants without significant PDA. Our data show that PI is an early and noninvasive parameter predicting poor perfusion and may be helpful in decision making for PDA closure.

## 26 IMPACT OF SEVERITY OF PERINATAL ASPHYXIA ON PERIPHERAL OXYGENATION AND PERFUSION IN NEONATES

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**Objective** The aim was to investigate the influence of perinatal asphyxia on peripheral oxygenation and perfusion in neonates in a prospective observational study.

**Methods** Neonates with over 34 weeks gestational age and birth weight >2000g without sepsis or congenital malformations were included. Neonates with an umbilical artery pH of (UapH)  $\leq 7.15$  and 5 minute APGAR score  $\leq 6$  were investigated. Neonates with an UapH  $\geq 7.15$ , and 5 minute APGAR score  $\geq 7$  served as control group.

Peripheral muscle near infrared spectroscopy (NIRS) measurement in combination with venous occlusion was performed once in the first 48 hours after birth. Tissue oxygenation index (TOI), mixed venous oxygen saturation (SvO<sub>2</sub>), fractional oxygen extraction (FOE), haemoglobin flow (Hbflow), oxygen delivery (DO<sub>2</sub>) and oxygen consumption (VO<sub>2</sub>) were assessed. Furthermore arterial oxygen saturation, heart rate, blood pressure and temperatures were measured. UapH was correlated to NIRS parameters.

**Results** Eight asphyxiated neonates were included. In the asphyxiated group significant correlations between UapH and DO<sub>2</sub> ( $r=0.78$ ), VO<sub>2</sub> ( $r=0.80$ ) and FOE ( $r=-0.75$ ) were found. The asphyxiated neonates were compared to 30 neonates in the control group. TOI ( $67.7\pm 5.5\%$ ) and DO<sub>2</sub> ( $29.0\pm 14.2 \mu\text{mol}/100\text{l}/\text{min}$ ) were significantly lower in asphyxiated neonates compared to the controls (TOI  $71.8\pm 4.9\%$ , DO<sub>2</sub>  $43.9\pm 16.9 \mu\text{mol}/100\text{l}/\text{min}$ ), FOE was significantly higher ( $0.33\pm 0.05$ ) compared to the controls ( $0.28\pm 0.06$ ). No correlation of UapH with NIRS parameters was observed in the control group.

**Conclusion** Peripheral oxygenation and perfusion measured with NIRS is compromised in neonates with perinatal asphyxia with worsening of parameters with severity of asphyxia.

## 27 METABOLIC OUTCOMES OF CHILDREN AND ADULTS BORN PRETERM

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Babies below 37 weeks gestation now account for 9–12% of all births, and babies < 32 weeks gestation for 1–2%. Survival is also rising, and the expectation of life-long health. Preterm babies appear to be at substantially greater risk of features of the metabolic syndrome. For example it is estimated that currently 1 in 15 newly diagnosed hypertensives will have been born preterm. Early nutrition is the likely candidate mediator of long-term effects as well as a potential attenuator of aberrant trajectories of metabolic health. We will summarise research addressing childhood and adult metabolic health following preterm birth, the evidence that early nutrition and preterm growth affects risk for the metabolic syndrome. We

will discuss methodological aspects of establishing causal relationships between infant feeding and later health outcomes, the pros and cons of observational versus randomized trials, practical issues in conducting infant nutrition studies/trials and performing long-term follow-up studies. We will provide an overview of the wide range of non-invasive technologies available for the identification of biomarkers in infants (including metabolomic technologies (using multi-component NMR/GCMS/LCMS platforms), genetic analyses using buccal swabs, and in vivo magnetic resonance imaging and spectroscopy to measure metabolites in the liver and brain.

## 28 THE QUEST TO IDENTIFY BIOMARKERS OF LONG-TERM OUTCOME IN THE NEWBORN

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We know that many events in the perinatal period have lifelong health implications. Work from animal models, and limited human data, suggest that deleterious long-term outcomes could be prevented by intervention in the neonatal period. While many studies of early life interventions are currently ongoing, outcome measures have to be in the short to medium term, even though the greatest impact of these interventions may not become apparent until well into adulthood. We are currently looking for biomarkers which can be measured non-invasively in the short term, but which have a strong association with long term outcome and may therefore provide indications of what the long-term effect of our experimental intervention may be. Methods currently being investigated include metabolomic technologies (using multi-component NMR/GCMS/LCMS platforms), genetic analysis using buccal swabs; in vivo magnetic resonance imaging and spectroscopy to measure metabolites in the liver and brain.

## 29 HEAD INJURIES

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This lecture will provide an overview of the pathophysiology of severe traumatic brain injury in children and the intensive care management of a child with severe TBI, focusing on the new WFPICS guidance (2012) and tiers of evidence. It will then present evidence for the nursing management of these children.

## 30 BIRTH AND REBIRTH - PARENTAL EXPERIENCES OF THEIR NEWBORN INFANTS TREATED WITH HYPOTHERMIA FOLLOWING PERINATAL ASPHYXIA

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The normal caring and nursing of newborn infants is to keep them warm and close to their parents. Fullterm newborn infants suffering from perinatal asphyxia are treated with induced hypothermia treatment (IHT) for three days at the Neonatal Intensive Care Unit (NICU) in order to prevent or decrease brain damages. The design of the study was a descriptive qualitative study. The aim was to describe and understand experiences of parents whose newborn infants were treated with IHT following perinatal asphyxia. A total of ten parents participated in the study, seven mothers and three fathers. Open-ended recorded interviews were conducted 4–12 months after the birth of their infants. Inductive content analysis