

a method of directly monitoring cerebral activity and oxygenation during transition and resuscitation after birth.

Methods Neonates >34 weeks gestation born via caesarean section were included. Cerebral activity was continuously measured with amplitude integrated EEG (aEEG) and cerebral oxygenation (rSO₂) with near-infrared-spectroscopy during the first ten minutes after birth. For quantitative analysis of aEEG the mean minimum amplitude (V_{min}) and maximum amplitude (V_{max}) was determined at every minute. Neonates with normal transition were compared to neonates with need of resuscitation.

Results Out of 224 eligible neonates 63 were included and 46 had reliable measurements: 31 with normal transition and 15 in need of resuscitation. Neonates with normal transition showed higher values for V_{min} in the third minute and higher values for V_{max} in the third and fourth minute compared to minute 10. Neonates requiring respiratory support had lower values for V_{min} in the ninth minute compared to minute 10. In neonates with normal transition rSO₂ values during the first six minutes were lower when compared to minute 10. rSO₂ values in neonates requiring respiratory support remained lower over the first eight minutes when compared to minute 10.

Conclusions This is the first study demonstrating the feasibility of aEEG and rSO₂ monitoring during neonatal transition. The cerebral activity pattern in compromised infants requiring resuscitation was different when compared to infants with normal transition.

225 EARLY PREDICTION OF OUTCOME IN EXTREMELY PRETERM INFANTS USING CRANIAL ULTRASOUND AND MRI SCORING SYSTEMS

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Background and aims Extremely preterm infants are at high risk of brain injury and adverse outcome. This study compares the predictive values of cranial ultrasound (CUS) and conventional magnetic resonance imaging (MRI) at term equivalent age (TEA) for cerebral palsy (CP) and/or severe cognitive delay.

Methods Eighty-four infants, born < 27 weeks of gestation, underwent MRI (1.5 T) and CUS (5–8 MHz) at TEA. Images were evaluated by three independent observers. A previously published (Horsch et al. 2010), modified CUS scoring system and a widely used MRI scoring system were applied (Woodward et al. 2006). At age 30 months corrected, 62 infants (74%) underwent neurological examination and assessment with the Bayley Scales of Infant and Toddler Development-III (BSITD-III). Cut off levels for developmental delay (–2 SD) were adjusted to an age and sex matched term born control group (n=85).

Results Both CUS and MRI scoring systems predicted CP with a sensitivity of 75%, while specificity was higher for MRI (96%, versus 91%). Predictive values for severe cognitive delay were equal and good, with sensitivities of 100% (specificity 95% for MRI, 90% for CUS).

Conclusion We conclude that, using the scoring systems applied in this study, both CUS and MRI at TEA are useful in predicting CP and/or severe cognitive delay at age 30 months. Furthermore, we suggest that these scoring systems, which can be used in clinical routine, are helpful tools in identifying infants who are at high risk of adverse outcome and should undergo MRI.

226 NUTRITION IN THE CRITICALLY ILL: ENTERAL AND PARENTERAL NUTRITION IN THE NEWBORN

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Initiating both parenteral nutrition with adequate protein:energy ratios and early enteral feedings strategies (within the first hours of life, whenever possible) seem to offer preventive advantage towards developing complicating illnesses and favour neurodevelopment. Human milk as early enteral feeding has trophic effects on the gastrointestinal tract and shows anti-infectious properties. The requirements of growth and organ development create a challenge in nutritional management of newborn infants, especially preterms and those with additional disorders, such as intestinal-failure, bronchopulmonary dysplasia, and sepsis. Nutritional support improves outcome in critically ill infants but is affected by fluid restriction, metabolic derangements, gastric intolerance and feeding interruptions. Few studies compare more critically ill infants with less critically ill infants as far as nutritional support during the initial weeks of life looking at growth and rates of adverse outcomes. Accordingly, the influence of critical illness on the risk of adverse outcomes seems to be mediated by energy intakes during the first week of life (Pediatr Res 2011; 69:522). Changes in amounts and ratios of protein and energy, fat quality (medium chain triglycerides, oleic acid and n-3 long-chain polyunsaturated fatty acids through parenteral nutrition), maintaining normoglycemia during full or partial parenteral nutrition, short- and medium term effects of either parenteral or enteral glutamine supplementations, daily supplemental zinc, rate of feeding advancements and avoidance of postnatal growth retardation represent the main items whose roles in critically ill preterm infants have been considered so far. Available data are still limited and do not allow for firm conclusions in most cases.

227 AMOUNT AND TIMING OF OWN MOTHERS MILK INTAKE IS ASSOCIATED WITH THE RISK OF NEC, SEPSIS OR DEATH IN PRETERM INFANTS

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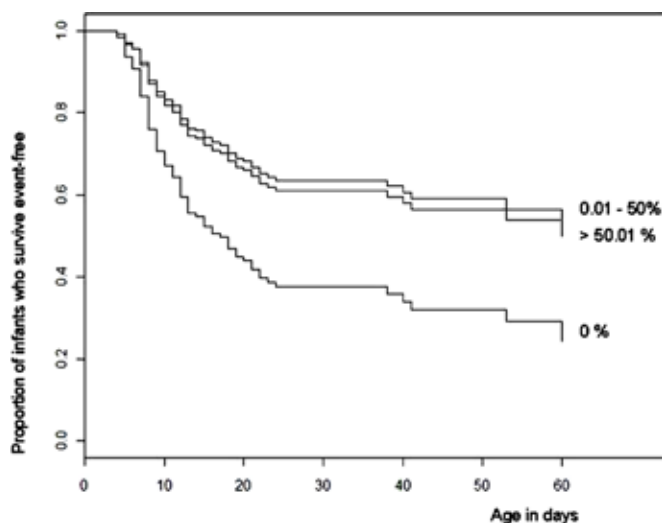
Background Necrotising enterocolitis (NEC) incidence is lower in preterm infants who are fed their own mother's milk (OMM) compared to formula. Possible mechanisms include protective factors of human milk or detrimental effects of formula. OMM is often unavailable, especially in the first few days following birth, while frequently donor milk is not available either.

Objectives To quantify the association between OMM intake during the first days of life and the incidence of sepsis, NEC and death.

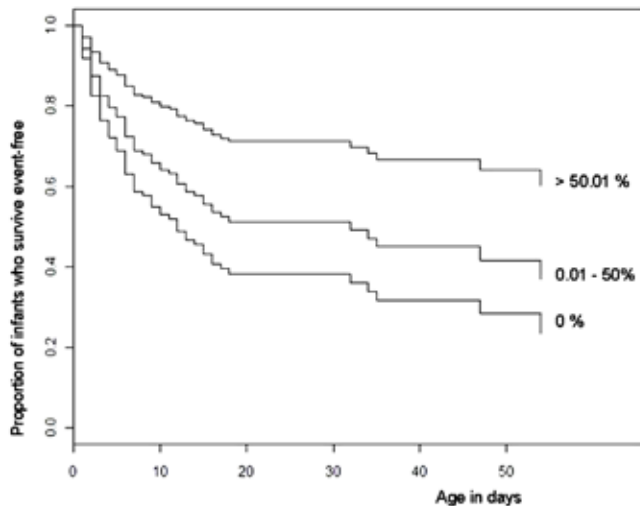
Methods Retrospective single centre study in infants with a birth weight < 1500g. Intake of OMM/formula during the first ten days of life were recorded. Episodes of sepsis, NEC and death were registered during 60 days. Statistics: Cox regression analysis.

Results n=349 infants. OMM intake during the first 5 days of life was associated with a lower incidence of NEC, sepsis and/or death during the first 60 days of life (hazard ratio(HR) of the category 0.01–50% OMM intake: 0.49 [95%CI 0.28, 0.87], HR of the category 50.01–100% OMM intake: 0.50 [95%CI 0.31, 0.83], compared to no OMM). During days 6–10, the protective effect was present if >50% of intake was OMM (HR=0.37 [95%CI 0.22, 0.65]).

Conclusion Any human milk during the first 5 days of life is associated with an decreased risk of NEC/sepsis/death, while the amount of human milk seems important from day 5–10.



Abstract 227 Figure 1



Abstract 227 Figure 2

228 FACTORS ASSOCIATED WITH CONSTIPATION IN A PEDIATRIC INTENSIVE CARE UNIT

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Backgrounds and aims Constipation is a frequent complication in critically ill patients although there are few studies in children.

Methods Prospective observational study with children admitted in the PICU for more than 3 days. PRISM, PELOD and PIM2 scores, total number of days with mechanical ventilation, duration and doses of sedatives and inotropes, and nutritional aims were recorded. Correlations between these parameters and time to first defecation were analyzed.

Results 84 children (median 13 months-old) were included. Mean time to first defecation was 4 days (range 0–19). A positive correlation with PRISM (r:0.39), PELOD (r:0.33) and PIM2 (r:0.48) scores (p<0.01) was observed. Moderate correlation existed between the time to first defecation with the administration of vecuronium (r:0.40 p<0.01) and the days without enteral feeding (r: 0.46 p<0.01). There was a low correlation with days of mechanical

ventilation (r:0.3 p<0.01), treatment with fentanyl (r:0.23 p<0.05), remifentanyl (r:0.25 p<0.05), and absolute and proportional gastric residual volume (r:0.24 p<0.05 and r:0.3 p<0.01, respectively). A negative association with daily enteral feeding volume (r:-0.37 p<0.01) was observed. Treatment with epinephrine or norepinephrine was also associated with a delay in the first defecation (5.6 vs 2.8 days p<0.01).

Conclusions Mean time to first defecation in critically ill children is 4 days. Constipation in critically ill children seems to be associated with severity of illness. Enteral nutrition could help bowel motility.

229

A RANDOMIZED PLACEBO CONTROLLED TRIAL OF BOVINE COLOSTRUM FED TO CHILDREN WITH SHORT BOWEL SYNDROME EVALUATED BY METABOLIC BALANCE STUDIES

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Background and aims Parenteral support is indicated in short bowel syndrome (SBS) patients with intestinal failure to avoid metabolic imbalance, electrolyte and nutrient deficiencies, and to maintain adequate growth and function. Length, function and adaptation of residual bowel, promoted by e.g. luminal stimulation by nutrients determine the subsequent form of therapy. Colostrum contains putative stimulatory factors why, we hypothesise that supplementation could promote adaptation in children with SBS. Intestinal absorption of energy and wet weight was used to assess efficacy of colostrum and to define intestinal failure.

Methods and materials Nine children with SBS were included in a double-blinded randomised cross-over trial. Twenty percent of their enteral nutrition was replaced with bovine colostrum and a milk-mixture for 4 weeks, separated by a 4 week wash-out period. Between baseline and end of study, children were clinical and biological assessed 4 times.

Results Four HPN-patients had mean energy absorption of basal metabolic rate (BMR) of 81% and wet weight absorption of basal fluid need (BFN) of 6% at baseline compared to 5 non-HPN-patients with mean energy absorption of BMR of 196% and wet weight absorption of BFN at 76%, p=0.02, p=0.05. Colostrum did not improve energy or wet weight absorption compared to milk-mix, p=0.85, p=0.59. Urea increased during colostrum supplementation, p=0.04.

Conclusion The degree of intestinal function and a distinction between intestinal insufficiency and failure can successfully be assessed by energy and wet weight balance studies. Bovine colostrum did not promote intestinal adaptation.

230

HYPOPHOSPHATEMIA: A RISK FACTOR FOR INSULIN REQUIREMENT IN ELBW INFANTS?

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