Conclusion: The FMS emulsion was associated with a marked reduction of plasma cholesterol. If fish oil reduces cholesterol byosintesis or enhances its clearance is unknown in preterm infants. The clinical benefits or lack of benefits of these findings should be assessed in cardiovascular and neurodevelopmental follow up studies.

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OPTIMAL POTASSIUM INTAKE FOR PRETERM INFANTS ON PARENTERAL NUTRITION

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Background and aims: Current guidelines for preterm parenteral nutrition aim to approximate normal foetal growth and avoid postnatal catabolism by achieving an earlier and higher intake of amino acids (AA) and calories (early aggressive parenteral nutrition, EAPN). Few investigations have explored whether electrolytes and water homeostasis could be modified by EAPN, but none have assessed electrolytes needs on EAPN. We performed a prospective observational trial to estimate potassium needs in relation to nutritional approach.

Methods: During 14 months all preemies (≤32 weeks) receiving PN in central or peripheral venous line were eligible. During the first week, we performed daily determination of plasma and urine electrolytes (8-hour collection), we recorded intakes, body weight and calculated potassium balance. For analysis infants were divided into 3 groups: low protein (LP) < 1g/kg/day; medium protein (MP) 1-2g/kg/day; high protein (HP) >2g/kg/day.

Results: 154 infants were entered. In the HP group kaliemia and kaliuria were significantly lower and non-oliguric hyperkaliemia was prevented. Potassium balance differed among groups: LP -3.6 mmol/kg/wk, MP -0.3 mmol/kg/wk and HP +2.6 mmol/kg/wk ($p< 0.001$). AA intake was the main independent factor influencing potassium balance, followed by caloric intake and day of life.

Discussion: Potassium balance and homeostasis are influenced by cellular integrity and function. AA intake is the main determinant for avoiding catabolism after birth. We showed that early AA intake have a strong influence on potassium balance. Our data allow us to calculate the optimal potassium requirements, in relation to AA and caloric intakes and day of life.

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POSTNATAL ENERGY AND PROTEIN DEFICITS ARE ASSOCIATED WITH POOR NEONATAL GROWTH: PRELIMINARY RESULTS FROM A SWEDISH POPULATION-BASED STUDY

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Background: Extremely preterm infants have extraordinarily high nutrient requirements and often show postnatal growth failure. It is still controversial, however, to what extent nutrition affects the weight development during the first weeks of life in these infants.

Aim: To explore possible associations of accumulated intake of macronutrients and weight development during the first 28 days of life. **Methods:** All extremely preterm Swedish infants (< 27 gestational weeks) born between April 2004 and March 2007 (the EXPRESS-study) who survived >24 hours (n=600). Parenteral and enteral nutrition data and anthropometric data for the first 28 days were collected. Data are mean±SD.

Results: Preliminary analyses of data from 152 infants (84 boys, gestational age 25.2±1.0 weeks, birth weight 756±168g, birth length 32.2±2.6 cm and head circumference 23.2±1.5 cm) showed that during the first 28 days of postnatal life, mean fluid intake was 164±17ml/kg/d, energy 97±13kcal/kg/d, protein 2.9±0.5g/kg/d, carbohydrates 11.0±1.1g/kg/d and fat 4.6±1.2g/kg/d. From birth to 28 days, ΔSDS was -2.2 SD for weight, -2.3 SD for length and -1.4 SD for head circumference. There was a significant correlation between ΔSDS for weight and protein intake ($r=+0.50$), energy intake ($r=+0.44$) and fat intake ($r=+0.39$) ($p< 0.001$ for all).

Conclusions: Extremely preterm Swedish infants

receive lower amounts of macronutrients, especially protein and energy, compared with current recommendations, and show significant postnatal growth failure. Our observation of significant positive associations between macronutrient intakes and weight change implies that improved early nutrient intakes may be one way to prevent postnatal growth retardation in these infants.

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TIGHT GLUCOSE REGIMEN IN CRITICALLY ILL INFANTS

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Background and aims: Treating hyperglycemia with insulin in critically ill children results in improved outcome and has become standard practice in many PICU's worldwide. Infants have an increased risk of developing hypoglycemia. We evaluated the outcome of critically ill infants treated with a step wise nurse-driven tight glucose protocol.

Methods: Infants (0 - 28 days) treated with a tight glucose protocol during a 3-year period in a tertiary PICU were retrospectively analysed.

Results: 385 children were treated, 78 (21,3%) were infants and therefore included for analyses. Overall mortality was 24.4%. Normoglycemia (< 8 mmol/L) was reached within 4,5 hours (range 1 - 25) with insulin (median dose 50 mIU/kg/hr; range 10 - 450). Median duration of treatment was 24 hours (range 1 - 308), 71% of the infants were treated less than 48 hours.

Hypoglycemia (≤ 2,2 mmol/L) and severe hypoglycemia (< 1,7 mmol/L) occurred in 7 (9,0%) and 2 (2,6%) infants respectively, but did not lead to clinical symptoms. Two (22,2%) hypoglycemic and 17 (24,6%) non-hypoglycemic infants died. Hypoglycemia occurred more than once in one hypoglycemic infant, and in both infants with severe hypoglycemia. Blood glucose levels prior to insulin treatment, dose and duration of insulin therapy, time to achieve normoglycemia, the use of corticosteroids and clinical diagnoses did not differ between hypoglycemic and non-hypoglycemic infants.

Conclusions: Infants were successfully treated with a step wise nurse-driven tight glucose protocol with a low percentage of severe hypoglycaemia. Overall treatment was short.

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BREASTFEEDING IN DANISH NICUS

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Objective: To describe the conditions for breastfeeding in Danish NICUs, the structures, breastfeeding policies and practices for premature infants.

Method: A national survey was conducted in August 2009, all 19 Danish NICUs responded.

Results: The 19 NICUs had a mean of 17 beds; five NICUs had obstetric service. All NICUs could have some mothers staying overnight (mean 10 mothers). Only two NICUs had restrictions for parent's presence. Most NICUs had a breastfeeding policy and written guidelines for breastfeeding premature infants and milk expression. Milk expression was recommended to start within six hours after birth, and most NICUs encouraged mothers to double pump. Most NICUs had systematic breastfeeding training for the staff; but only 5 NICUs had a lactation consultant (IBCLC). All NICUs allowed the premature infants to suckle when they still had nasal CPAP. During transition from tube feeding to breastfeeding, the most common method for supplementation in all NICUs was tube feeding; only two NICUs would offer the infant bottle-feeding during transition. Half of the NICUs used test-weighting. The aim for most NICUs was to initiate skin-to-skin contact the first time the parents was in the NICU, and for most infants skin-to-skin contact continued 2-4 hours or up to eight hours a day.

Conclusion: The Danish NICUs gave high priority to breastfeeding reflected in policies for milk expression, supplementation, skin-to-skin contact and parent's presence in the NICU. The survey was first part of an ongoing national breastfeeding survey with expected participation of nearly 2.000 premature infants.