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Background Hyperalimentation describes the increase in glucose, amino acid (AA) and lipid intake designed to overcome postnatal growth failure in preterm infants. We have previously shown increasing parenteral AA intake increased 14/22 individual AA levels with only tyrosine lower. Hyperalimentation increases hyperglycaemia requiring insulin treatment. We hypothesised insulin administration may increase AA utilisation so lowering AA levels.

Aim To compare the plasma AA profiles in preterm infants with insulin-treated hyperglycaemia with those who did not receive insulin.

Methods Infants < 29 weeks gestation were originally randomised to receive hyperalimentation (25% more glucose, 4g/kg/day versus 3g/kg/day protein/lipid) or a control regimen within 5 days of birth with head growth as the primary outcome. The study protocol recorded actual nutrient intake and parenteral nutrition "intolerance" including hyperglycaemia, insulin use and AA profiles. AA levels were measured on day 9 (ion exchange chromatography).

Results 118 AA profiles were obtained from 142 infants on day 8–10. Secondary analysis restratified data to compare insulin (n=57; hyperalimentation n=37) with no insulin (n=61; hyperalimentation n=20) treatment. Infants receiving insulin were of lower gestation/birthweight (p<0.01) and received more protein (3.0g/kg/day versus 2.7g/kg/day; p=0.02) mainly as intravenous AA, when compared to those not receiving insulin. The insulin-treated group had lower levels in 9/22 AAs (p<0.05) and no statistically significant difference in the remaining 13 (p>0.05).

Conclusion Preterm infants with insulin-treated hyperglycaemia have lower AA levels on day 8–10 despite lower birthweight, gestation and higher protein intake. This suggests exogenous insulin may improve AA utilisation for protein synthesis.

1354 EVALUATION AND COMPARISON OF CALCIUM AND PHOSPHORUS IN THE IMPROVEMENT OF METABOLIC BONE DISORDER IN PREMATURE INFANTS

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Background Metabolic bone disease is a common condition among premature Neonates. The aim of this study was to determine the impact of calcium and phosphorus on radiological and biochemical character osteopenia in premature neonates.

Methods This trial was done in forty premature Neonates over a period of six months in the All these babies are fed with breast milk, and 400 units of vitamin D daily They, randomly divided into two groups. Half of these babies received supplement of Calcium (45 mg/kg/day) and phosphorus (24mg/kg/day).

Serum calcium, phosphorus, and alkaline phosphatase with growth parameters (including weight, height, and head circumference) was measured every two weeks. At the end of this time wrist x-ray for evaluating of osteopenia was done. The collected data was analyzed with SPSS 11.5.

Results Radiological changes characteristic of osteopenia have been found in 40% (8 cases) of infants in the case group and 65% (13 cases) of infants in the control group (P= 0.113). Serum calcium, phosphorus, and alkaline phosphatase levels was not statistically different (P>0.05). Weight gain was similar in both groups (P= 0.097). but, linear and head circumference rise in the case group were significantly greater than control group (P= 0.002 and P= 0.015, respectively).

Conclusion Calcium and phosphorus supplementation in preterm breast-fed infants were seem to be effective on prevention of osteopenia and improvement of growth. Thus, we recommend oral calcium and phosphate supplement addition accompanying with breast-feeding in premature neonate.

1355 INCIDENCE OF SERUM HYPOPHOSPHATEMIA IN GROWTH RESTRICTED AND APPROPRIATELY GROWN PRETERM INFANTS

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Background Infants with intrauterine growth restriction (IUGR) often have metabolic and electrolyte abnormalities. Our aim was to determine the incidence of hypophosphatemia in IUGR versus appropriate for gestational age (AGA) premature infants.

Methods A retrospective review of infants ≤32 weeks or ≤1500 grams who had a serum phosphorus within 48 hours after birth. We collected maternal and neonatal demographic data and electrolyte values. Infants below the 10th percentile on the Fenton Growth Curve were categorized as IUGR. Serum hypophosphatemia was defined as < 4mg/dL and serum hypokalemia as < 3.5mg/dL.

Results Over a 4 year period, 304 infants were eligible. Of these, 54 were IUGR (mean birth weight (BW) of 848 grams and mean gestational age (GA) of 28+6 weeks) and 250 were AGA (mean BW of 1067 grams and mean GA of 27+6 weeks). 48% of the IUGR infants had hypophosphatemia compared with only 6% of the AGA infants (p<0.05). The IUGR infants with hypophosphatemia had a lower birth weight and GA than the IUGR infants without hypophosphatemia. This difference was not observed among AGA infants. 15.1% of the IUGR infants (8/53) had a serum potassium of < 3.5mg/dL compared to 7.6% of the AGA infants (19/250). There was a moderate correlation between serum phosphorus and serum potassium. Overall mortality was < 1%.

Conclusions Hypophosphatemia is very common among IUGR infants < 32 weeks GA and there is a moderate correlation with hypokalemia. These electrolyte abnormalities probably reflect adaptive mechanisms associated with growth restriction in utero.

1356 CONTINUOUS GLUCOSE MONITORING IN VERY LOW BIRTHWEIGHT PRETERM INFANTS ON FULL ENTERAL FEEDS

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Background We previously observed hypoglycaemic episodes in preterm infants after achieving full enteral feeds and during a stable postnatal period. The purpose of this study was to prospectively determine subcutaneous glucose levels in this population.

Methods Preterm infants < 32wks gestational age were enrolled for continuous subcutaneous glucose monitoring over 72hrs in two cohorts: A: 500–999g (n=16); B: 1000–1500g (n=9). All infants were fed according to a standard feeding protocol where full feeds are provided at 150–180ml/kg/d of fortified EBM or premature formula at 110–135kcal/kg/d. Primary outcome was the frequency and quality of hypoglycaemic episodes within 72 hours, defined as tissue glucose < 2.5mmol/L.

Results 81.3% of the infants in A and 44.4% in B showed relevant glucose fluctuations during monitoring. Hypoglycaemic episodes occurred in 37.5% in group A, compared to 22.2% in group B. In group A 7% of infants showed glucose values below 1.7mmol/L. We also observed hyperglycaemic episodes (>8.3mmol/L) after feeds (A: 57%, B:17%), followed by rapid drops in both cohorts. Cumulatively, all hypo- and hyperglycaemic episodes lasted >60 min (16%), 35–60 min (21%), 10–30min (60%) and < 5min (3%) per patient. The main risk factors for glucose instability were gestational age and weight at trial.