



September 18th, 2021 08:30 - 10:30

PARALLEL SESSION 33 - NUTRITION 5

ID 205. INSULIN RESISTANCE AND HYPERGLYCEMIA IN VERY LOW BIRTH WEIGHT INFANTS - RESULTS FROM THE LIGHT STUDY

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Background: Hyperglycemia is a common condition in very low birth weight infants (VLBW; < 1500 g) which has been associated with adverse outcomes such as mortality and neurodevelopmental disabilities. Both insulin resistance and relative insulin deficiency were suggested as possible mechanisms but description of relevant metabolic markers of insulin resistance in preterm infants during the admission period is scarce. This study aimed to analyze blood markers for insulin resistance in VLBW infants at 7 days of age and at postmenstrual age (PMA) 36 weeks.

Methods: The Very low birth weight infants - glucose and hormonal profiles over time (LIGHT) study is a prospective observational cohort study that included 50 VLBW infants born during 2016-2019 and admitted to the tertiary neonatal intensive care unit at Umeå University hospital, Sweden. Perinatal and glucose data were registered prospectively during the admission period. Blood samples were obtained at 7 days of age and at PMA 36 weeks, mostly just before feedings. Samples were analyzed for plasma C-peptide, insulin, proinsulin and leptin levels. Hyperglycemia was defined as a single glucose value > 8 mmol/L at any time during the admission period.

Results: Lower gestational age was associated with higher plasma C-peptide levels at 7 days of age, and with higher plasma C-peptide, insulin and leptin levels at PMA 36 weeks (all $P < 0.05$). Extremely low birth weight (ELBW; < 1000 g) was associated with higher plasma proinsulin levels at 7 days of age compared to infants with birth weight 1000-1500 g ($P < 0.01$). At PMA 36 weeks, ELBW was associated with higher plasma C-peptide, insulin, proinsulin and leptin levels (all $P < 0.05$). Hyperglycemic infants had higher plasma proinsulin levels at 7 days of age, and higher plasma C-peptide, insulin, proinsulin and leptin levels at PMA 36 weeks ($P < 0.005$). Proinsulin/insulin ratio did not differ between hyperglycemic and normoglycemic infants.

Conclusion: Lower gestational age and birth weight are associated with increased insulin resistance in preterm infants nearing term age. Hyperglycemia in VLBW infants is associated with increased insulin resistance and intact insulin secretion. Further studies are needed to explore possible treatment modalities.

None declared



ID 241. Questioning the adequacy of standardized vitamin D supplementation protocol in very low birth weight infants: a prospective cohort study

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BACKGROUND: Preterm infants are at increased risk for vitamin D insufficiency or deficiency. The vitamin D status of preterm infants at birth depends entirely on the vitamin D status of their mothers. Although intensity of the researches on vitamin D accelerated in the last decade, the amount of vitamin D intake required to maintain vitamin D status in preterm infants remains still controversial. We aimed to assess the adequacy of standardized vitamin D supplementation protocol in very low birth weight (VLBW) infants. In addition, to determine vitamin D status of mother/infant couples and to investigate the associations between vitamin D status at birth and morbidities of the infants.

METHODS: In this single-center, prospective cohort study blood samples were collected from 55 mothers just before delivery and from their infants at birth and on the 30th day of life (DOL) for 25-hydroxy vitamin D (25OHD) measurements. According to standardized supplementation protocol vitamin D was initiated in dose of 160 IU/kg by parenteral nutrition on the first DOL and oral vitamin D supplementation (400 IU/day) was administered when enteral feedings reached 50% of the total intake or on the 15th DOL, whichever was earlier.

RESULTS: The median 25OHD levels of the infants were 16.12 (9.14-20.50) in cord blood and 36.32 (31.10-44.44) in venous blood on the 30th DOL ($p < 0.01$). In 98% of the VLBW infants 25OHD reached sufficient levels on the 30th DOL. None of the mothers had sufficient vitamin D levels (25OHD > 30 ng/ml). Maternal 25OHD levels were correlated with the 25OHD levels of the infants in cord blood ($r = 0.665$, $p < 0.001$). There was a significant difference in mean cord 25OHD levels between winter (13.65 ± 5.69 ng/ml) and summer seasons (19.58 ± 11.67 ng/ml) ($p = 0.021$). No association was found between neonatal morbidity and vitamin D status.

CONCLUSION: With the current supplementation protocol the majority of the VLBW infants with deficient/insufficient serum 25OHD levels reached sufficient levels on the 30th DOL.

None declared



ID 271. Two types of third-generation lipid emulsions for parenteral nutrition in neonates: a randomized pilot study of short-term neonatal outcomes

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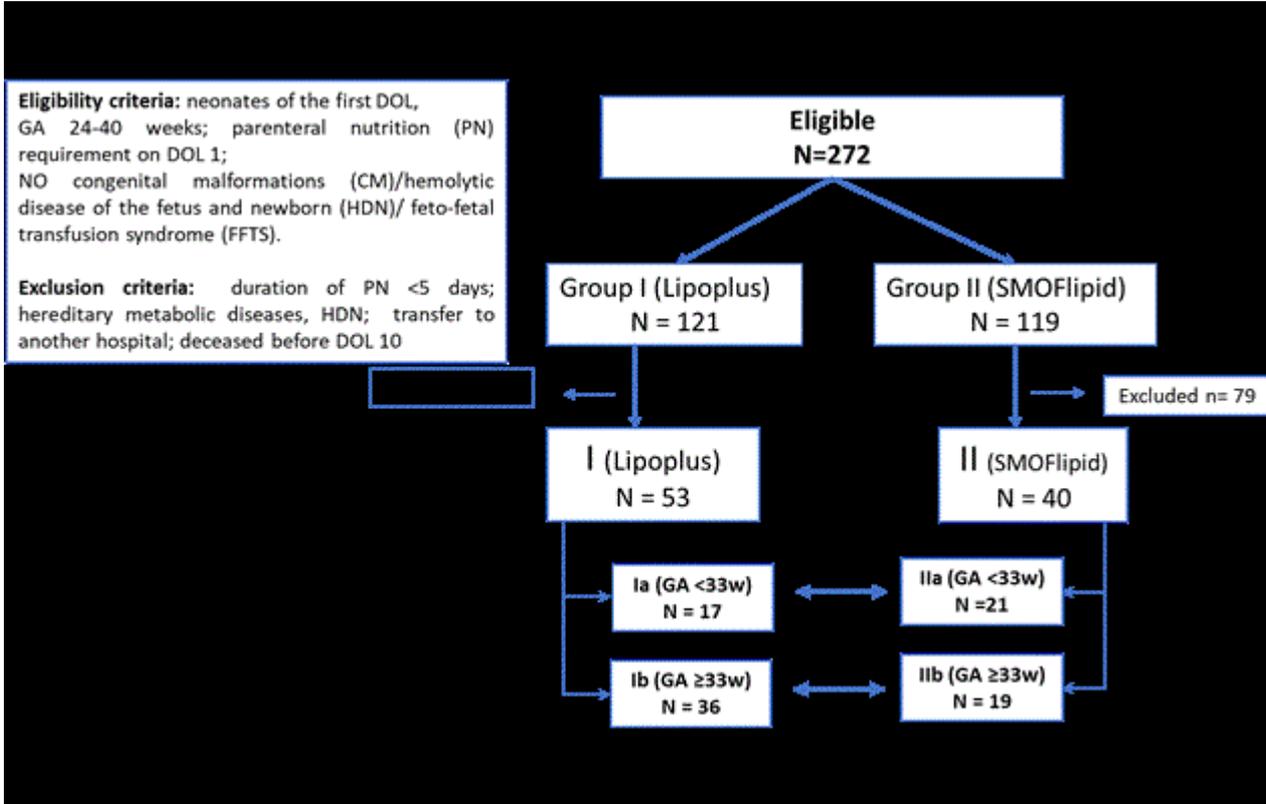
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BACKGROUND. It is assumed that lower content hepatotoxic phytosterols from soybean oil and a higher content of anti-inflammatory components (Fish oil (FO) ω -3 PUFA, α -tocopherol from olive oil) in the intravenous lipid emulsions (IVLE) will contribute to a decrease in the incidence of neonatal cholestasis (NC), bronchopulmonary dysplasia (BPD) and retinopathy of prematurity (ROP). However, this hypothesis hasn't been confirmed by studies in neonates. Our study aimed to assess the frequency of NC, BPD, and ROP in newborns receiving 2 types of 3rd generation IVLE: the 1st - 10% FO, 40% soybean oil, and 50% coconut oil (Lipo-Plus), vs the 2nd - 15% FO, 30% soybean oil and 25% olive oil (SMOFlipid).

METHODS. 272 newborns GA 24-40w were randomly assigned to Group I (Lipoplus) and II (SMOFlipid). 125 neonates met the exclusion criteria. Subgroups according to GA were compared: Ia (<33 w, n = 17) vs IIa (<33 w, n = 21); Ib (GA \geq 33 w, n = 36) vs IIb (GA \geq 33 w, n = 19). Assessed parameters: total bilirubin (Bil), direct Bil, alkaline phosphatase (ALP), P, Ca on DOL 10, 20, and 30, the frequency and severity of NC, BPD, and ROP.

RESULTS. The groups were comparable (BW, GA, Apgar score, gender, frequency of CS, antenatal RDS prophylaxis, PN, and MV duration). The incidence of NC and ROP didn't differ. BPD was noted in 1/17 vs 4/21 in subgroups Ia and IIa, which didn't reach statistical significance (p = 0.63). The level of ALP was higher in patients receiving SMOFlipid: on DOL 10 (Ia - Me = 324 vs IIa - Me = 484 U/L, p = 0.016), and on DOL 30 (Ib - Me = 286 vs IIb - Me = 480 U/L). The other assessed biochemical parameters did not differ.

CONCLUSION. Comparative analysis of the 2 types of IVLE didn't reveal a statistically significant difference in the incidence of NC, BPD, and ROP. The revealed increase in ALP and a tendency to an increased BPD incidence in neonates on SMOFlipid require further investigation with lipid blood profile on a larger sample of patients with long-term PN.



None declared



ID 494. COMPARATIVE CLINICAL EFFECTIVENESS OF TWO METHODS OF HYPERGLYCEMIA CORRECTION IN VERY LOW BIRTH WEIGHT PRETERM INFANTS

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Background

Management of early neonatal hyperglycaemia in preterm newborns remains controversial. The aim of this study was to compare clinical effectiveness of two methods of hyperglycaemia correction (insulin therapy and reduction of glucose infusion rate) in VLBW infants with respiratory distress syndrome (RDS).

Methods

Sixty VLBW newborns (gestational age < 32 wks.) with hyperglycaemia and RDS were enrolled in the study on the first day of life and were followed until discharge or death. Criteria of hyperglycaemia were blood glucose concentration (BGC) > 8.3 mmol/L with glucosuria (GU) or BGC ≥ 10 mmol/L regardless of GU. The neonates were randomly divided into 2 groups. Newborns in the insulin group (n=30) were treated with insulin (0.1 U/kg) and control babies (n=30) were managed with reduction of glucose infusion rate by 25%. Normal saline was infused for 1 hour if above mentioned measures were ineffective and hyperglycaemia persisted with BGC > 10 mmol/l.

Results

The groups were not different in terms of gestational age and birth weight (28.07± 2.38 wks. and 1016.33±245.25 g in the insulin group vs. 28.23±2.31 wks. and 1058.33±258.95 g in the control group; p>0.05). The median age at the first episode of hyperglycaemia and median time to normalization of glycaemia were the same in both groups – 1 day and 1 hour respectively. The duration and number of episodes of hyperglycaemia recurrence didn't differ either. The incidence of postnatal growth retardation at the postmenstrual age of 36 weeks was higher in the group of glucose reduction (27%) versus 15% in the insulin group, but the difference was not significant (p>0.05). Reactive hypoglycemia occurred in 6.7% neonates from glucose reduction group and in 20% from insulin group (p>0.05). There was no statistical difference in the frequency of adverse outcomes, such as mortality, intraventricular haemorrhage, sepsis, necrotizing enterocolitis, and retinopathy of prematurity.

Conclusion

Both reduction of glucose infusion rate and insulin therapy are clinically equivalent methods of hyperglycaemia treatment in VLBW infants but reduction of glucose infusion rate can be associated with suboptimal postnatal growth.

None declared