September 20th, 2023 09:00 - 11:00

PARALLEL SESSION 3 - NUTRITION 1

ID 991. HIGHER LEVELS OF ANTISECRETORY FACTOR IN MOTHERS OWN MILK IS ASSOCIATED WITH REDUCED INCIDENCE OF SEPSIS IN PRETERM INFANTS

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Background: Antisecretory Factor (AF) is a protein present in breastmilk that regulates inflammatory processes. AF can be increased by commercially available dietary supplements, classified as food for special medical purposes. A small RCT has shown increased AF levels in breast milk and a preventive effect on mastitis. Inflammation and inflammatory reactions contribute to preterm birth and trigger complications leading to major morbidities in in preterm infants with significant impact on longterm health, parental stress, and societal costs.
We aimed to investigate the level of AF in mothers' own milk (MOM) in relation to sepsis and other neonatal morbidities in preterm infants.

Methods: Samples of breastmilk and infant plasma were collected at 1, 4, and 12 weeks after birth from 38 mothers and their 49 infants born before 30 weeks gestation. AF–compleasome in MOM was determined by a sandwich enzyme–linked immunosorbent assay (ELISA) and inflammatory markers in infant plasma by a panel of 92 inflammatory proteins. Neonatal treatments and outcomes as sepsis, necrotizing enterocolitis (NEC), bronchopulmonary dysplasia (BPD), patent ductus arteriosus (PDA), intraventricular haemorrhage (IVH), and retinopathy of prematurity (ROP) were recorded.

Results: The level of AF in MOM week 1 was lower for infants with later sepsis compared to no sepsis (p = 0.005). Corrected for nutritional intake of MOM, higher levels of AF decreased the risk for sepsis, OR 0.24. AF in MOM week 1 was negatively correlated to inflammatory proteins in infant plasma week 4, markedly IL–8, which was also associated with infant sepsis. A higher AF–compleasome in MOM week 1 was inversely associated with the number of inflammatory morbidities in the infant (any combination of sepsis, NEC, BPD, PDA, IVH and/or ROP) (Spearman's rho –0.361, p=0.01, Kruskal Wallis test p=0.048)

Conclusion: Naturally high amounts of antisecretory factor in mothers' own milk during the first week after birth, is associated with lower risk for sepsis and less inflammation in the preterm infant. AF in MOM may be an important component in the anti–inflammatory and protective effects of breastmilk for preterm–born infants, and maternal dietary supplementation to increase AF a possible target for future interventions.

None declared

ID 635. EFFECT OF SUPPLEMENTAL DONOR HUMAN MILK COMPARED TO PRETERM FORMULA ON NEURODEVELOPMENT OF VERY LOW BIRTH WEIGHT INFANTS: 5.5-YEAR FOLLOW-UP OF A RANDOMIZED CLINICAL TRIAL

Professor Deborah O'Connor[1,2], Nicole Bando[1,2], Professor Margot Taylor[2], Dr. Julie Sato[2], Dr. Nicole Law[2], Dr Jingxiong Xu[3], Dr. Alex Kiss[4], Dr Sharon Unger[1,5]

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Background

Use of supplemental pasteurized donor human milk (PDHM), when maternal milk is unavailable, reduces the risk of necrotizing enterocolitis versus preterm formula (PTF) among very low birth weight (VLBW, <1500 grams) infants. In the Donor Milk for Improved Neurodevelopmental Outcomes trial, we reported more VLBW infants supplemented with PDHM compared to PTF had a 18 month cognitive score indicative of neuroimpairment (JAMA 2016;316(18):1897–1905). This study reports the impact of supplement–type on neurodevelopment at school entry.

Methods

VLBW infants were fed either PDHM or PTF for 90 days or to discharge, whenever maternal milk was unavailable. The primary outcome was the Full Scale IQ (FSIQ) on the Wechsler Preschool and Primary Scale of Intelligence (WPPSI–IV) at 5.5 years. Secondary outcomes included WPPSI–IV subscales. In exploratory analyses, executive function was assessed using the NEPSY–II and BRIEF.

Results

Of 316 infants (363 enrolled, 37 died, 10 withdrawn), 158 children participated in this follow–up study (n=80 PDHM, n=78 PTF). Mean birth weight and gestation in the follow–up study was 1013 (SD, 264) g and 27.8 (2.5) weeks, and 53% were male. Twenty–six (33%) children in the PDHM group and 21 (27%) in the PTF group received only mother's milk. Median (IQR) %total feeds as maternal milk was 69% (30%, 95%) in the PDHM group and 70% (11%, 96%) in the PTF group. As randomized, mean WPPSI–IV FSIQ scores were 91.2 and 98.3 in the PDHM and PTF groups, respectively (fully adjusted effect: –7.2 [95% CI: –13.0, –1.5]; p=0.01). No statistically significant differences were found in executive function. In three–way analysis where children fed exclusively mother's milk were considered separately, differences in mean WIPPSI–IV FSIQ scores between PDHM (90.8, 95% CI: 85.6, 96.1) and PTF (97.1, 95% CI: 91.5, 102.8) groups were no longer statistically significant; neither were other measures of neurodevelopment.

Conclusion

Use of supplemental PDHM compared with PTF during hospitalization did not improve neurodevelopment. Notably, NICU care, including PDHM processing optimization has evolved significantly since the original trial. Strategies to promote mother's milk feeding, and improve processing of PDHM to retain important nutrients and bioactive components continue to be urgently required.

Funding provided by the Canadian Institutes of Health Research. SU is the medical director of the Rogers Hixon Ontario Human Milk Bank and DO serves on its advisory committee.

ID 13. The DIAMOND trial – DIfferent Approaches to MOderate & late preterm Nutrition: Determinants of feed tolerance, body composition and development

Doctor Tanith Alexander[1,2], Doctor Sharin Asadi[2], Dame Jane Harding[2], Doctor Michael Meyer[1,3], Doctor Yannan Jiang[4], Doctor Mariana Muelbert[2], Professor Clare Wall[5], Associate Professor Jane Alsweiler[3,6], Professor Frank Bloomfield[2]

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Background: Moderate–to–late–preterm (32+0—36+6 weeks' gestation) babies account for >80% of all preterm births. There is a lack of evidence on the optimal nutrition strategy following birth; this has been identified as a research priority by several organisations.

Methods: We undertook a multi–centre, factorial, randomised, controlled trial in babies born 32+0 — 35+6 weeks' gestation with intravenous (IV) access whose mothers intended to breastfeed, randomising babies to combinations of three factors until full milk feeds were established: (1) IV amino acid solution vs. IV dextrose; (2) milk supplement vs. exclusive mother's own milk (MOM), and (3) exposure to taste/smell or not before gastric tube feeds. The primary outcome for factors 1 and 2 was fat mass % at 4 months' corrected age, analysed using linear regression models

adjusted for hospital site, gestation and sex, and for factor 3, days to full enteral feeds (defined as 150 mL.kg−1.day−1 or exclusive breastfeeding, whichever occurred first), analysed using Cox proportional hazard models. All analyses were controlled for the non-independence of multiple births using a cluster effect.

Results: 532(55% boys) babies were recruited. Primary outcomes were assessed in 526(99%) babies at discharge and 324(61%) at 4 months' corrected age. % fat mass at 4 months' corrected age was not different between babies given IV amino acids or dextrose (factor 1) [mean(standard deviation, SD) 26.0(5.4) vs 26.2(5.2)%, p=0.7] or between babies given milk supplement vs MOM (factor 2) [26.3(5.3) vs 25.8(5.4)%, p=0.3]. Time to full enteral feeds was not different between babies exposed or not exposed to taste/smell [mean(SD) 5.8(1.5) vs 5.7(1.9) days, p=0.6]. There also was no difference in the time to full enteral feeds for factor 1 [5.7(1.7) vs 5.8(1.8) days, p=0.6] or factor 2 [5.7(1.7) vs 5.8(1.7) days, p=0.1]. Time to discharge from the neonatal unit was similar between groups [overall 23.0(12.1)].

Conclusions: Provision of parenteral nutrition or formula in addition to MOM does not affect body composition at 4 months' corrected age. Early nutritional support strategies do not affect time to full enteral feeds or days in hospital. Providing breastmilk only should be the goal for the nutritional management of moderate-to-late-preterm babies.

None declared

ID 835. Supplementation with docosahexaenoic acid (DHA) and arachidonic acid (AA) to extremely preterm appears to alleviate thrombocytopenia as a risk factor for severe retinopathy of prematurity (ROP).

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BACKGROUND:
Low levels of docosahexaenoic acid (DHA) and arachidonic acid (AA) and low platelet counts are associated with retinopathy of prematurity (ROP), but the nature of their association is unknown.

METHOD: Longitudinal serum DHA, AA, and protein levels were analyzed, and platelet count was recorded during the first postnatal month in Swedish infants born <28 weeks gestational age (GA), 2016 to 2019, randomized to receive postnatal enteral supplementation of AA/DHA or standard nutrition (controls). Thrombocytopenia was defined as a platelet count <100 x 109/L. Association between levels of DHA, AA, platelet counts, and platelet–related proteins were assessed during the infants' first postnatal month and associated with the development of severe ROP (ROP stage 3 and treated). Analyses were adjusted for GA, birth weight (BW) standard deviation

and randomized AA/DHA supplementation. The interaction between AA/DHA supplementation and thrombocytopenia was investigated.

RESULTS: The 178 infants had a mean BW of 806 ±200 grams and a mean GA of 25.6 ±1.4weeks. Thrombocytopenia first postnatal month was present in 28% of the controls and 20% of the AA/DHA supplemented group (adj. p=0.32). Thrombocytopenia first postnatal month was found to be a risk factor for severe ROP overall (adj. OR 2.48, 95% CI 1.03- 5.99, p=0.043); however, there was a numerical difference in the risk factor effect in the control group (adj. OR 4.27, 95% CI 1.23-14.83), p=0.022) compared to the AA/DHA group (adj. OR 1.37, 95% CI 0.34- 5.46, p=0.66), p for interaction 0.28. DHA and/or AA levels were positively associated with levels of platelet-related proteins such as platelet-derived growth factor subunits A and B (PDGFA and PDGFB) and negatively with tissue plasminogen activator (TPA); in contrast, the association with severe ROP was the opposite.

CONCLUSIONS: Postnatal enteral supplementation with AA/DHA to extremely preterm infants numerically reduced early thrombocytopenia as a risk factor for severe ROP. Levels of AA and DHA were associated with levels of platelet-related proteins, and we hypothesize that the effect of AA/DHA supplementation on severe ROP may be modulated through platelet activation and function.

None declared