September 15th, 2021 15:00 - 17:00

PARALLEL SESSION 10 - NUTRITION 2

ID 167. FORTIFICATION OF HUMAN MILK WITH BOVINE COLOSTRUM IN VERY PRETERM INFANTS

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Background: Very preterm infants have high nutritional needs to support optimal growth and development. Accordingly, nutrient fortifiers are often added to mothers' own milk or donor human milk for such infants. However, there are concerns that such fortifiers, similar to infant formula products, may predispose to feeding intolerance, necrotizing enterocolitis (NEC) and late-onset sepsis (LOS). We hypothesized that intact bovine colostrum, rich in proteins, bioactive components and immunoglobulins, may be a good alternative to conventional fortifiers to stimulate growth without increasing NEC and LOS incidence.

Method: In a multicentre, open-label randomized pilot trial (NCT03537365), human milk for very preterm infants (26-31 weeks of gestation) was fortified with powdered bovine colostrum (BC, Biofiber Damino, Denmark, n=115) or a powdered conventional fortifier (CF, PreNAN FM85, Nestlé, Switzerland, n=117) when enteral feedings reached 100-140 mL/kg/d, and until 35 weeks post-menstrual age. Up to 1.4 g protein per 100 mL milk was added (e.g. 2.8 g BC, 4.0 g CF). Weight and head circumference (HC) were recorded at birth, weekly during the intervention, and at discharge. Plasma amino acids (AA) were analysed two weeks after start of fortification.

Results: Weight and gestational age at birth were similar between groups (1167±327 g and 28.5±1.4 weeks, pooled means±SD). Z-scores for weight and HC from birth until discharge did not differ between groups ($p=0.16$ and $p=0.72$, respectively), neither did delta z-scores for weight and HC in the same time period ($p=0.87$ and $p=0.22$, respectively). BC intake increased the mean levels of several AAs (Ser, Gly, Asn, Gln, His, Ala, Pro, Arg, Phe, Orn, Gln, +10-20%, all $p<0.05$), with more pronounced increments of a few AAs (Val, Tyr, +40%, both $p<0.001$). However, all AA values remained within reference levels. Fortification with BC did not affect the incidences of NEC (BC: 3/115 vs. CF: 5/117, $p=0.49$) or LOS (BC: 24/115 vs. CF: 16/117, $p=0.17$) (both unadjusted values).

Conclusion: Very preterm infants given human milk fortified with intact bovine colostrum showed similar short-term growth and moderate increases in AA levels, relative to infants given a conventional fortifier. Larger trials are required to verify effects on NEC, LOS and other health outcomes.

University of Copenhagen has filed a patent on BC for infants (PCT/DK2013/050184) together with Biofiber Damino. PTS has declined share of revenue and was not participating in NICU clinical work

ID 284. Neonatal admissions for Hypoglycaemia: balancing risks and benefits through the use of a lower treatment threshold fro hypoglycemia

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Background: Early identification of hypoglycaemia in at risk babies can reduce risk of persistent brain injury. There is no consensus internationally however, on a treatment threshold that is safe but also minimises over medicalization of at risk babies. In 2020 the hypoEXIT study demonstrated treatment at a blood sugar threshold of 2mmols/L was non inferior to a traditional threshold (2.6 millimols/L) with regard to psychomotor development at 18 months. We implemented this new threshold for treatment of hypoglycaemia in May compared admissions for neonatal hypoglycaemia to our neonatal unit, before and after implementation of the new protocol.

Methods: Setting: tertiary neonatal unit in a maternity hospital with c9000 deliveries annually. Retrospective study, of all newborn babies >35 weeks admitted with hypoglycaemia as primary reason for admission, Data were collected from electronic patient's charts; from 16/09/19 to 15/03/20 and 01/06/20 to 15/11/20 and compared. We assessed overall number of admissions for hypoglycaemia, demographic data of those admitted including background risk factors, medical management, length of stay and discharge destination.

Results: There was no significant difference in baseline characteristics. There was a reduction in the admission rate of patients with hypoglycaemia from 118 (3% neonatal unit admissions) to 34 patients (0.9% neonatal admissions) between the two time periods. Additional treatment with boluses or intravenous (IV) fluids also reduced with the new protocol threshold. A bolus of dextrose was required in 25% vs 6& (<2.6mmol/L group vs <2.0mmol/L). 38% of patients required IV fluids in <2mmol group compared to 45% in the <2.6mmol group. (See Table). No babies suffered adverse effects of hypoglycaemia such as seizures in either timeframe.

Conclusion: we demonstrated a greater than two thirds reduction in admission rate with no increase in adverse events for babies with hypoglycaemia following a reduction in treatment threshold from 2.6mmols to 2mmols/L. This resulted in reduced workload for the neonatal unit, and decreased separation of newborn babies from their mothers. The lessons we learned can be applied to other maternity hospitals and we hope will reduce mother and baby separation and enhance bonding and breastfeeding improving maternity and newborn care.

Table 1 shows comparison between different variables before and after implementing of hypoglycaemia protocol.

Demographic data	**Hypoglycaemia threshold 2.6mmols/L** **Sept. 2019- March 2020**	**Hypoglycaemia threshold 2.6mmols/L** **June to December 2020**
Total number of deliveries	3883	3806
Admission with hypoglycaemia	118 (3%)	34 (0.9%)
Median gestational age	39^{+1} (IQR: 38-40^{+1}week)	38^{+5} (IQR: 37^{+5}- 40weeks)
Median birth weight (kg)	3.45 kg(IQR: 3-3.9)	3.7 kg(IQR: 3-4.5)
Symptoms on Admission	Symptomatic (46%) A (54%)	Symptomatic (30%) A (70%)
Sugar on admission (mmol/l)	1.4 (IQR: 1.2-1.5)	1.5 (IQR: 1-1.8)
Repeated blood sugar mmol/l	2 (IQR 1.6-2.5)	2.3 (IQR: 1.8-3)
Glucogel alone/without IV fluids	55% (66/118)	62% (21/34)
IV Glucose boluses %	25% (29/118)	6% (2/34)
IV Glucose and Glucogel %	45% (52/118)	38% (13/34)
IV glucose duration (hours)	18 (IQR:12-30)	17 (IQR: 15-62)
Length of stay (days)	1.75 (IQR 1-3)	2 (IQR 2-3)
Discharge Destination	Home: 27%, PN ward 73%	Home: 24%, PN ward 76%
Risk factors	**Before**	**After**
Maternal diabetes mellitus	42 (35%)	10 (29%)
Low birth weight	4 (3%)	1 (3%)
No risk factor	72 (62%)	23 (68%)

Table 1 shows comparison between different variables before and after implementing of hypoglycaemia protocol.

none

ID 356. The in-hospital growth pattern of preterm infants identifies the true growth faltering better than EUGR cut-off.

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Background. Extrauterine growth restriction (EUGR) is often reported in VLBW preterm infants, and is not necessarily predictive of adverse outcomes. The growth pattern and not a one-time size value at discharge could improved the identification of true growth faltering and optimized the outcomes.
The aim was to describe the growth pattern of VLBW preterm infants according to the occurrence of EUGR during the hospitalization with or without morbidities.
Methods. We analyzed the clinical records of VLBW infants admitted in our NICU between 2015 tand 2020. We computed the weight z-scores (WZS) at birth, at first week of life (W1), at the day of achieving full enteral feeding (FEF day) and at discharge according to Intergrowth-21st Growth Charts. EUGR was defined as a delta-WZS between birth and discharge >1. The infants were categorized in EUGR+ with morbidities (BPD, NEC, sepsis) or without morbidities and EUGR-. We performed a paired T-test between the WZS at the different periods and an ANOVA test with Bonferroni post hoc analysis.
Results. We included 414 VLBW infants. Their characteristic and WZS are described in the table.
The birth weight of EUGR+ infants without morbidities was significantly higher (p=0.02) than that of EUGR + with morbidities and EUGR- infants. The EUGR+ infants without morbidities showed the main loss in WZS during the first week, similar to that observed in infants EUGR- (48% of total lost). However, the delta-weight loss between birth and W1 was higher in EUGR+ infants without morbidities compared to EUGR-infants (p=0.001). EUGR+ infants with morbidities showed a continuous decline after the first week of life until discharge.
Conclusions. EUGR+ infants who developed morbidities are a category that need a multidisciplinary approach that include the neonatologist and the nutritionist, in order to limit their true growth faltering. In EUGR+ infants without morbidities, the main weight loss was observed during the first week of life. The early discharge with the growth assessment prior the growth slowing of the reference healthy preterm infants, that occurs around 40 weeks, could explain the inclusion in EUGR+ category of theses infants.

	Infants EUGR+ without morbidities (n=32)	Infants EUGR+ with morbidities (n=63)	Infants EUGR- (n=319)
GA (weeks)	30.4±2.0	27.9±2.2*	28.7±2.5
Birth weight (g)	1317±172	1013.0±256*	1194.0±253^
GA at discharge (g)	37.5±1.2	41.6±5.0*	38.8±3.5
Weight loss %	11.0±4.4	11.3±4.7	9.2±4.4
WZS at birth	-0.21±1.18	-0.22±1.01	-0.91±1.08§
WZS at W1	-1.08±1.38	-0.59±1.05	-1.09±1.27^
WZS at the FEF day	-1.18±1.18	-1.31±1.2	-1.13±1.19
WZS at discharge	-1.73±0.98	-1.89±0.9	-1.06±1.06§
Delta-WZS from birth to W1	0.72±0.54	0.38±0.77	0.19±0.69+
Delta-WZS from W1 to FEF day	0.17±0.47	0.81±0.89*	0.06±0.95
Delta-WZS from FEF day to discharge	0.54±0.64	0.55±0.85	-0.06±0.71§
Delta-WZS from birth to discharge	1.51±0.60	1.66±0.61	0.14±0.57§

*=EUGR+ with vs EUGR+ without morbidities and EUGR-; p<0.001
§=EUGR- vs EUGR+ with and without morbidities: p<0.001
^= EUGR-vs EUGR+ with morbidities: p=0.02
+= EUGR-vs EUGR+ without morbidities: p=0.001
*=EUGR+ with vs EUGR+ without morbidities and EUGR-; p<0.001
§=EUGR- vs EUGR+ with and without morbidities: p<0.001
^= EUGR-vs EUGR+ with morbidities: p=0.02
+= EUGR-vs EUGR+ without morbidities: p=0.001
None declared

ID 396. Mild therapeutic hypothermia is safe for preterm infants with NEC stage II

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BACKGROUND:
Therapeutic hypothermia to premature infants is not considered safe; however, it can be helpful to diseases treatment. Mild therapeutic hypothermia has beneficial effects on adults and pediatric patients.
We evaluated the safety of mild therapeutic hypothermia for premature infants with necrotizing enterocolitis stage II.

METHODS:
A Quality study was performed from January 2015 to March 2021. The NEC diagnosis (established by the modified Bell criteria) was made by the neonatology team and two independent neonatologists. The SQUIRE checklist was followed. The patients were divided into two groups: the control group (antibiotics and fasting) and the hypothermia group (conventional treatment and passive hypothermia for 48 hours after diagnosis). Hypothermia was induced by turning off the incubators' heating mechanisms, with a room temperature of 23-25° C. The target temperature was 35 ° C (0.5 °± C). The cooling speed was 0.5°C per hour; the vital signs and esophageal temperature were monitored every 15 minutes. Clinical and laboratory outcomes were assessed for 72 hours (before hypothermia, during 48 hours of hypothermia, and 24 hours after rewarming). Multiple log-binomial regression models were adjusted to estimate the relative risks; N-Sofa and IG were covariates. The linear model of mixed Bayesian effects was adjusted to compare means (CI 95%).

RESULTS:
83 newborns were included, 53 underwent therapeutic hypothermia, and 30 remained received the conventional treatment. Normothermia group versus hypothermia group: Gestational age mean was 30.3 (±8.7) versus 32.4 (±3.3) weeks, mean weight at NEC onset was 1063(±654,8) g versus 1221.6 (±633.5)g. Hypothermia group presented a significant mean difference: higher hemoglobin level 2.05 (IL: -3.49; UL: -0.49); higher sodium level 3.97 (IL: -6.92; UL: -1.1); higher PO2 / FiO2 0.69 (IL: -1.3; UL: -0.07), lower potassium level -1.04 (IL: 0.6; UL: 1.5). lower creatinine level -0.38 (IL: 0.1; UL: 0.67) and lower lactate level -1.2 (IL: 0.13; UL: 2.3). Hypothermia did not cause hemodynamic or thermal instability, coagulation, ventilatory or metabolic disorders. Hypothermia decreased the mortality (RR = 0.11 (0.02; 0.53). (Table 1)

CONCLUSION:
Mild hypothermia is feasible, safe, and unrelated to adverse effects, in addition to protecting death in preterm infants with NEC.

Variables	Hipothermia (n=53)	Control (n=30)	RRaj (95%CI)

Dystermias*	48 (90.6%)	27 (90%)	1.01 (0.61; 1.9)
Desaturation (<90%)	29 (54.7%)	23 (76.7%)	0.72 (0.40; 1.30)
Apnea	20 (37.7%)	9 (32.1%)	1.31 (0.56; 3.03)
Bradycardia (<100 bpm)	19 (35.9%)	6 (20%)	1.86 (0.71; 4.92)
Tachycardia (>160pbm)	34 (64.2%)	22 (73.3%)	0,95 (0.53; 1.70)
Seizures	5 (9.4%)	4 (13.8%)	0.62 (0.15; 2.56)
Coagulopathy	1 (3.3%)	1 (10%)	0.15 (0.004; 5.16)
Thrombocytopenia	16 (30.8%)	14 (48.3%)	0.76 (0.35; 1.65)
Arterial hypotension	23 (43.4%)	19 (65.5%)	0.82 (0.43; 1.58)
Metabolic acidosis	17 (34%)	20 (66.7%)	0.56 (0.28; 1.14)
Hyperkalemia	13 (28.9%)	14 (46.7%)	0.70 (0.31; 1.56)
Hypocalcemia	5 (9.4%)	3 (10%)	1.08 (0.23; 4.99)
Anuria (< 1ml/kg/h)	3 (5.7%)	1 (3.3%)	3.00 (0.29; 30.90)
Bleeding (anywhere)	18 (34.0%)	11 (36.7%)	1.23 (0.55; 2.77)
IVH	3 (6.0%)	3 (10.3%)	0.95 (0.17; 5.07)
Sepsis during NEC	39 (73.6%)	29 (96.7%)	0.83 (0.5; 1.40)
Death related to NEC	2 (3.8%)	11 (36.7)	0.11 (0.02; 0.53)

Multiple log-binomial regression of laboratory values and clinical parameters of the groups during 48 hours after diagnosis of NEC.
Dystermias:Variations outside the recommended range:hypothermia group 35.5 and normothermia group 36.5
None declared

ID 519. OroPharyngeal Therapy with Mother's Own Milk (OPT-MOM) Improves Feeding and Reduces Length of Stay in Premature Infants

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Background: OroPharyngeal Therapy with Mother's Own Milk (OPT-MOM) can serve as substitute for biofactor-rich amniotic fluid, providing oropharyngeal immunostimulation until per-oral feeds can be provided to preterm infants (PT). We hypothesized that OPT-MOM improves immune function and intestinal health, thereby improving feeding tolerance and reducing length of stay.
Objectives: To measure effects of OPT-MOM on reducing length of stay, time to full enteral feedings and to full oral feedings and reducing NEC incidence, late-onset sepsis (L-OS), and death in PT <1250 grams.
Methods: A double-blind, placebo-controlled, randomized safety and efficacy trial of OPT-MOM among PT infants in 5 NICUs (Group A, OPT-MOM, n=105 v. Group B, placebo, n=101). Infants were randomized to receive 0.2mL of 'study substance' every 2hs for 48hs (beginning < 96hs of life), then every 3hs until 32w CGA.
Results: There were no differences in birthweight, GA, or Snappe Score for groups A and B. Compared to B, A had shorter length of stay (mean+/-SD: 77±33 v. 86±38days, d=0.25, p=0.23), shorter time to reach full enteral feedings (21±15 v. 28±35days, d=0.26, p=0.40), and reduced time to reach full PO feedings (23±16 v. 29±31days, d=0.24, p=0.18). L-OS was similar (15.1% v. 15.6%), as it was mortality (1.2% vs 1.1%), but there was a trend towards less NEC (1.2% v. 3.4%, p=0.37) in A v. B, respectively. Sample size using PASS 14.0 software (NCSS, LLC. Kaysville, UT), with a two-tailed alpha of 0.05 and a 20% attrition rate was estimated at 548 infants (n=274 in each group), to detect a minimum effect size of 0.24 with 80% power, suggesting that the findings are relevant and that results may have reached statistical significance with a larger sample size.
Conclusion; In this pilot study, we found a 9-day reduction in length of stay, 7-day reduction in time to full enteral feedings, a 6-day reduction in time to full PO feedings, as well as lower NEC in OPT-MOM-treated infants, compared to controls. We speculate that less inflammation and improved commensal microbiome contributed to these improved outcomes. A 9-day reduction in stay for PT infants is a potential savings of 1.8 billion in USD yearly.

None declared