



N&G 2023 – Oral Presentations Abstracts

O001 / #302

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURETY I

03-31-2023 10:30 - 11:30

GROWTH AND BODY COMPOSITION OF MODERATE AND LATE PRETERM INFANTS UP TO 6 MONTHS CORRECTED AGE, A RANDOMIZED CONTROLLED TRIAL ON NUTRITION AFTER DISCHARGE

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Background and Aims:

In preterms, early nutrition is key for ensuring optimal growth and body composition, thereby mitigating potential cardiometabolic risks. In moderate-to-late preterm (MLP) infants (i.e., gestational age (GA) 32-36 weeks), we aimed to test the effects of protein- and mineral-enriched postdischarge formula (PDF) versus standard term formula (STF), compared to human milk (HM), on growth and body composition between term equivalent age (TEA) and 6 months corrected age (CA).

Methods:

MLP infants were included at birth and fed PDF and/or fortified HM, depending on parental preference. At TEA, exclusively PDF-fed infants were randomized to receive either PDF (n=47) or STF (n=50); unfortified HM-fed infants (n=60) served as controls. At TEA and 6 months CA, we assessed anthropometry and dual-energy x-ray absorptiometry estimated lean mass (LM), fat mass (FM), and bone mineral content (BMC).

Results:

All groups had similar GA (median(P25;P75): 34.3(33.5-35.1) weeks), birthweight (mean±SD: 2175±412 g), anthropometry and body composition at TEA, except for lower %FM at TEA in PDF- than HM-fed infants (17.4±6.2 versus 19.8±6.6%, P=0.02).

At 6 months CA, PDF-fed infants had similar weight and FM but higher head circumference and LM than STF-fed infants (head circumference: 43.9±1.3 versus 43.4±1.5 cm; LM: 4772±675 versus 4502±741 g; P<0.05). Also, PDF-fed infants had higher length and BMC than STF- and HM-fed infants (length: 67.7±2.5, 66.9±2.6, 67.0±2.5 cm; BMC: 140.1±20.3, 130.8±22.6, 128.2±19.7 g; P<0.05).

Conclusions:

MLP infants fed PDF, compared to STF, from TEA to 6 months CA demonstrated modest improvements in LM, BMC, length, and head circumference, potentially beneficial for future health.

O002 / #367

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
03-31-2023 10:30 - 11:30

MATERNAL VITAMIN D LEVELS AND THE RELATIONSHIP TO NEONATAL ANTHROPOMORPHIC MEASUREMENTS

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Background and Aims:

Studies have highlighted vitamin D as crucial for growth, development, immunity, and is of particular importance during pregnancy. Pregnant and lactating women are at a greater risk for vitamin D deficiency. Understanding the impact of vitamin D status on optimal infant growth may inform nutritional recommendations in pregnant women – especially those at-risk of preterm delivery.

Methods:

An IRB-approved study collected 105 maternal and 86 cord blood samples at delivery. Plasma concentrations of vitamin D (25-OH-D) were determined using high performance liquid chromatography. Vitamin D deficiency was defined as total 25-OH-D levels <20ng/mL. Infant birth anthropometrics were obtained from the medical record, and the Mann-Whitney U tests was use to compare each between maternal and infant vitamin D deficiency groups. A p-value of <0.05 was considered statistically significant.

Results:

Median maternal 25-OH-D was 39.3ng/mL with 7.6% of mothers deficient. The median infant of 25-OH-D was 23.734ng/mL with 24.8% of infants deficient. Median birth head circumference percentiles were significantly higher in infants of sufficient mothers vs deficient mothers (64.23% vs. 17.64%, p=0.05) There were no differences in birthweight percentile (p=0.386) or birth length percentile (p=0.437) between maternal sufficiency groups, or any differences between infant deficiency groups.

Conclusions:

Neonatal head circumference is associated with neurodevelopment and is used to diagnose conditions such as microcephaly. Previous research has suggested that vitamin D might be involved in brain function as a “neurosteroid” in adults; it is unclear whether this function extends to neonates. Future studies should explore neonatal outcomes in a larger vitamin D deficient population.

O003 / #370

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
03-31-2023 10:30 - 11:30

PROTEIN METABOLISM IN PRETERM AND TERM INFANTS USING A 15N-TRACER AND THE NITROGEN BALANCE METHOD: A PILOT-STUDY

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Background and Aims:

Maximizing utilization of amino acids (AA) supports accrual of fat-free mass in preterm infants. AA oxidation and urea formation should be low. Optimizing macronutrient composition, protein-to-energy, and carbs-to-fat-ratio are required. Kinetics of urinary N-excretion using 15N-labeled-AA after enteral ingestion can measure protein turnover and urea production. This study aims to establish a tracer method for NICU.

Methods:

Observational study, stable growing newborns were enrolled at McMaster Children's Hospital. Nitrogen kinetics was measured using a single oral application(3.3mg/kg) of 15N-98atom%-labeled AA mixture.

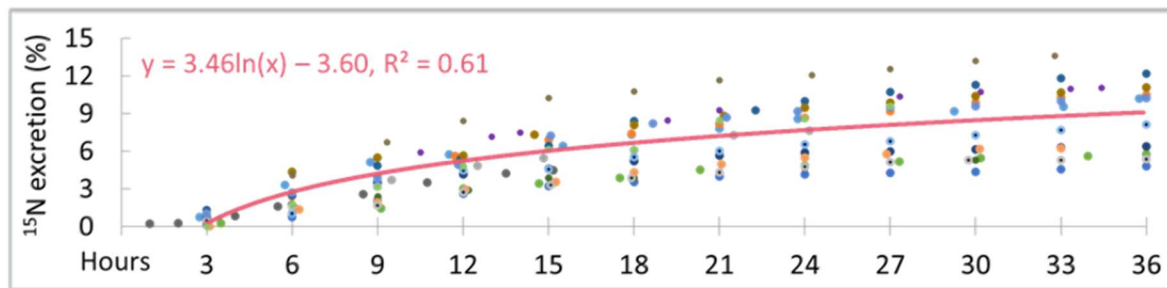
Urine was collected in 2-to-4hr intervals over 36hr. Urinary-15N, urea, and creatinine were measured. Using an established three-compartment model, nitrogen balance, protein turnover and net protein gain were calculated.

Results:

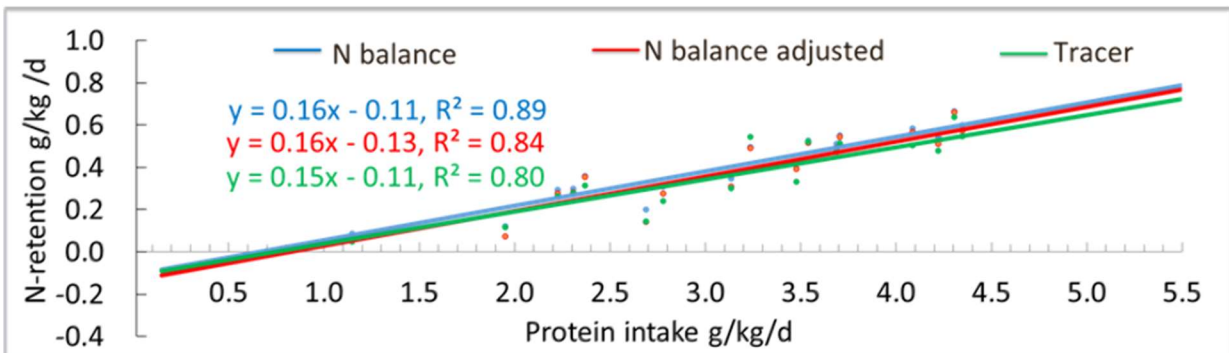
Eighteen male infants were enrolled (GA:25-39weeks, birth weight:720-2770g). No adverse events were reported during the study.

Individual variation of urea, creatinine, and urine volumewas high making spot urine samples not reliably measure protein accretion.

Cumulative urinary excretion from tracer varied between 4-14%. Urinary¹⁵N-kinetic curves plateaued at 36 hrs(Fig 1).



N-balance and tracer method yielded similar slopes of regression lines. A linear relation was observed between N-retention and protein intake from 1.3 to 5.5 g/kg/d. X-axis zero intercept was at 1.0g protein kg/d which compares with previous studies(Fig 2).



Conclusions:

The ^{15}N -Tracer method is a safe tool to analyze protein turnover. The high correlation between tracer kinetic and balance method data indicates the reliability of the ^{15}N -Tracer method. In future studies, protein synthesis should be studied using ^{15}N -Tracer technique to identify optimal macronutrient composition for preterm.

O004 / #63

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
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ENTERAL FEEDING OF VERY LOW BIRTHWEIGHT INFANTS IS FREQUENTLY MARKEDLY BELOW THE PRESCRIBED AMOUNT

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Background and Aims:

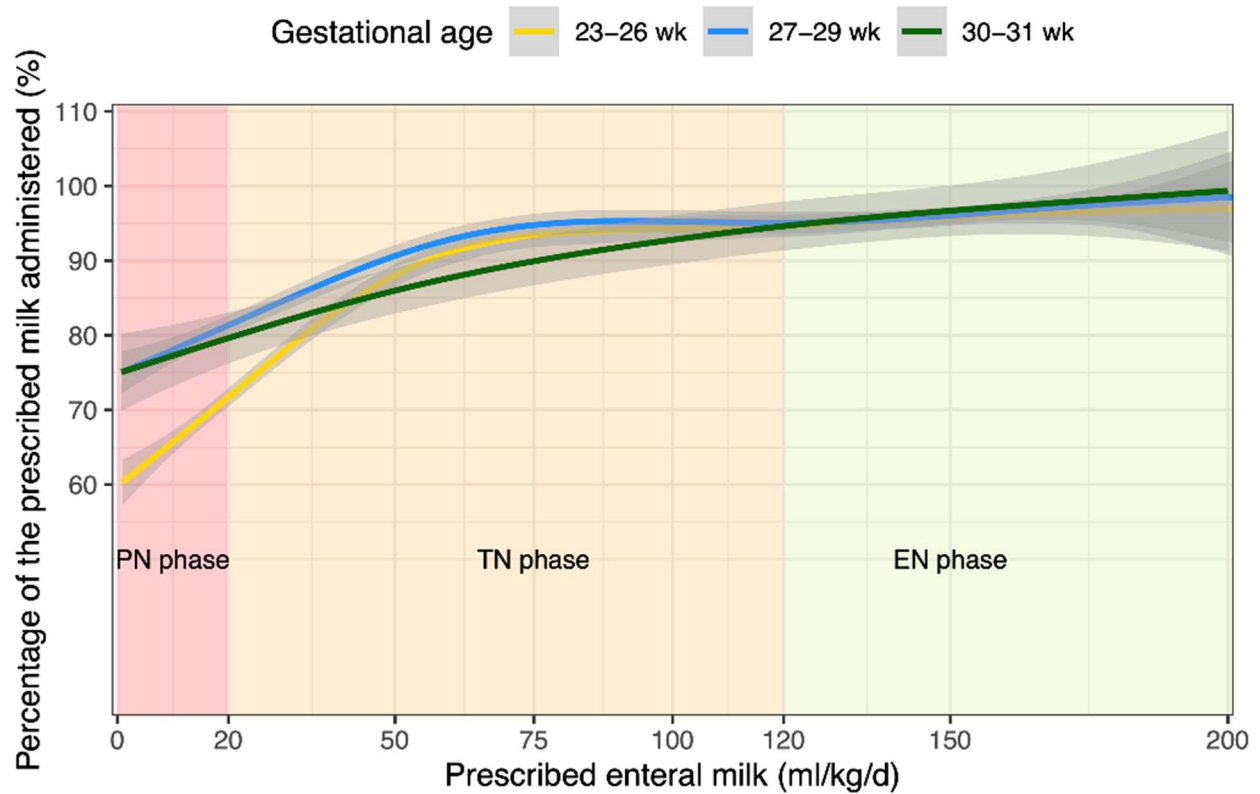
Feeding a very low birthweight (VLBW, <1500 g) infant is challenging. Our aim was to study how prescribed enteral feeding is implemented during the first weeks of life in VLBW infants.

Methods:

This retrospective cohort study included all VLBW infants born in 2005–2013 with a gestational age (GA) of <32 wk who stayed at least for the two first weeks of life in our neonatal intensive care unit. Prescribed and administered nutritional data until the age of four weeks were retrieved from electronic medical records. The nutritional management was divided into three phases: parenteral (PN, milk intake <20 mL/kg/d), transition (TN, milk intake \geq 20 and <120 mL/kg/d), and enteral (EN, milk intake \geq 120 mL/kg/d) phases.

Results:

516 infants were included and divided into three groups according to GA at birth: 23–26 wk (n=239), 27–29 wk (n=240), and 30–31 wk (n=37). During the EN phase, median [IQR], 98% [96–100%] of the prescribed enteral milk was administered. However, during the PN phase, 70% [38–100] of the prescribed enteral milk was administered, and the discrepancy was highest among 23–26 wk group. The prescribed amount was less likely administered if higher volume of gastric residual was aspirated or if the infant did not pass stool during the same day.



Conclusions:

Implementation of enteral feeding in VLBW infants differs from the planned feeding especially during the PN phase in the tiniest ones. Identifying risk factors behind this might improve the nutritional care of VLBW infants.

O005 / #371

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
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FORTIFICATION WITH FREEZE-DRIED BREAST MILK IN PRETERM INFANTS ≥ 31 WEEKS OF GESTATION – GROWTH AND SAFETY

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Background and Aims:

Cow's milk protein used in most fortifiers increases the risk of necrotizing enterocolitis. A fortifier made from BM could reduce risks. Freeze-dried BM powder is available. It increases protein and energy intake but could add excess calories due to high fat content (desirable extra intake at 1.4 g protein/100mL: 1.0g fat, 2.0g carbs, actual intake 4g fat, 6g carbs), suggesting its use more for mature PT. This study aims to evaluate safety and to compare growth with a historical match-pair group.

Methods:

Observational study (PT ≥ 31 weeks), intervention group (IG): BM fortified with 4.8g/100ml lyophilized BM (AS50-Ammeva, Werder). Vitamins and Ca-glycerophosphate were supplemented. Growth, body composition (PeaPod), clinical chemistry, feeding tolerance and macronutrients of BM (MIRIS, Sweden) were analyzed. The control group (CG) received standard fortification (FMS, Nutricia, Germany) and had matching criteria: birth weight ± 100 g, GA ± 1 wk.

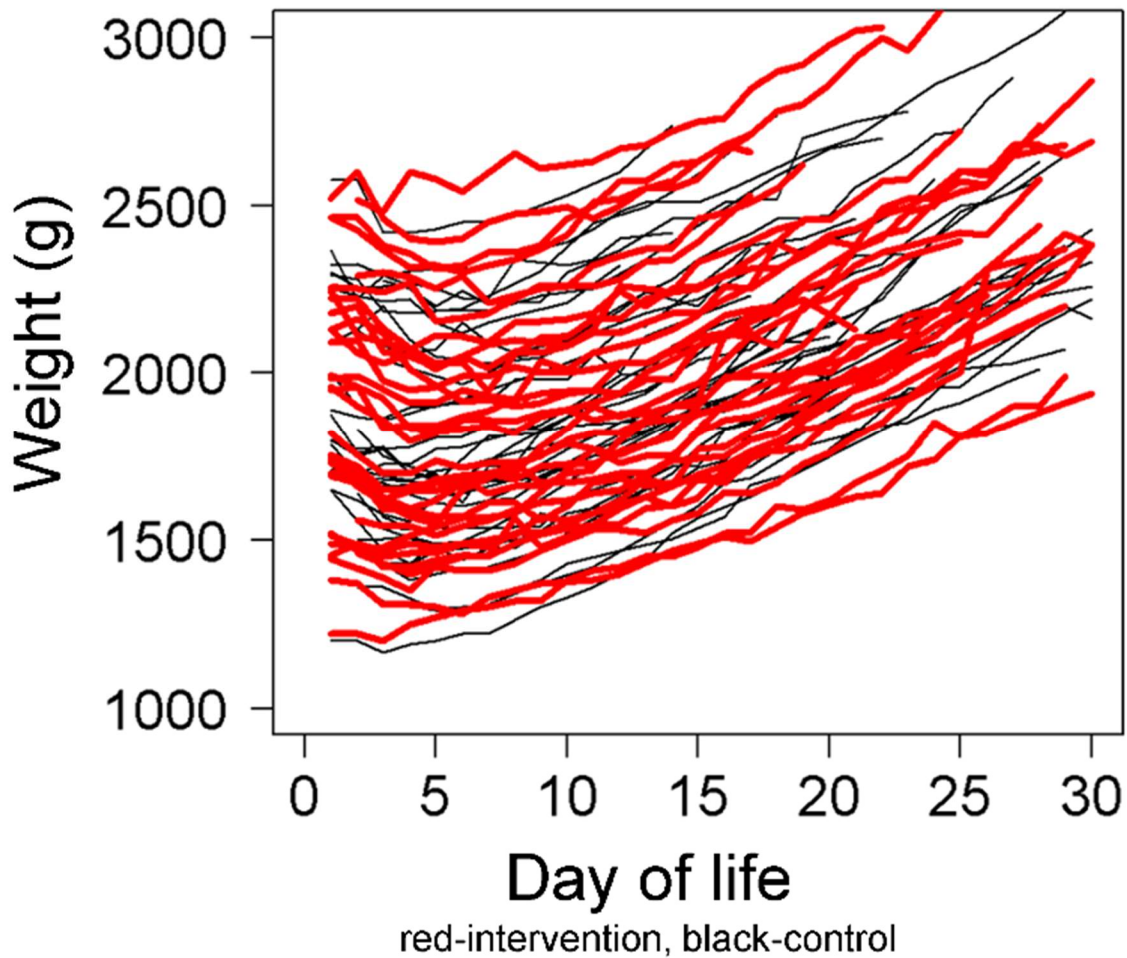
Results:

64 PT, patient characteristics and outcome parameters were not different between groups (Fig.1). In IG, PT received a nutritonal intake of 157 ± 8 ml/kg/d, 14.0 ± 0.9 g/kg/d carbs, 3.3 ± 0.4 g/kg/d protein, 7.4 ± 1.1 g/kg/d fat, and 136 ± 12 kcal/kg/d energy. Urea was 21 ± 12 mg/dl, triglycerides 105 ± 36 mg/dl, blood glucose 86 ± 19 mg/dl. At 36weeks (PMA), fat mass was 290 ± 110 g (12 $\pm 3\%$) and fat-free mass 2050 ± 240 g).

No significant differences for feeding tolerance, growth and discharge weight between groups (Fig.2).

	Intervention (n=32)	Control (n=32)
Birth		
Gestational age (weeks)	32.8 ± 1.0	33.0 ± 1.2
Birth weight (g)	1900 ± 380	1840 ± 370
Length (cm)	43.3 ± 2.6	43 ± 3.0
Head circumference (cm)	30.5 ± 1.5	30.6 ± 1.3
Birth weight percentile	48 ± 28	44 ± 23
Enteral nutrition		
Enteral intake 120 mL/kg/d (DOL)	5.0 ± 1.3	5.2 ± 1.5
Start fortifier (DOL)	6.8 ± 1.8	6.8 ± 2.7
Discharge		
Length of stay (days)	27 ± 7	27 ± 10
Postmenstrual age (weeks)	36.5 ± 0.9	36.6 ± 1.2
Weight (g)	2500 ± 380	2490 ± 360
Weight percentile	30 ± 24	26 ± 18
Length (cm)	46.5 ± 2.5	47.1 ± 2.3
Head circumference(cm)	32.5 ± 1.4	32.5 ± 1.5

Growth trajectories



Conclusions:

Fortification with freeze-dried BM is well tolerated by PT \geq 31 weeks and growth is similar to cow's milk-based fortifiers. To better meet the nutritional requirements of PT (<1.5kg), higher macronutrient intake and protein to energy ratio are required. Multicenter studies are needed to validate the results.

O006 / #266

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
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CAREGIVER FEEDING PRACTICES, NUTRITION RISK AND WEIGHT STATUS OF VERY LOW BIRTH WEIGHT INFANTS COMPARED TO TERM-BORN PEERS AT SCHOOL-AGE

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Background and Aims:

Very low birth weight (VLBW; <1250g) infants have an elevated risk of early onset cardiometabolic disease. The role of nutrition and caregiver feeding practices is unknown. We explored associations between feeding practices, diet, and weight of VLBW vs. term-born children from similarly diverse communities at school-age.

Methods:

VLBW children (n=74; 61% female) attending the 6-year OptiMoM Fortifier follow-up and socioeconomically similar term-born controls (n=74; 57% female) participated (NCT04308902). We evaluated associations between caregiver-reported feeding practices, nutrition risk (NutriSTEP[®]) and BMI z-scores using linear mixed models stratified by birth group and adjusted for parent ethnicity, BMI and education, and child sex.

Results:

More VLBW children had high nutrition risk (32%) than term-borns (13%; p=0.02). Overall, 23% of children had overweight/obesity (no group differences). VLBW caregivers reported using more pressure to eat (p=0.02), feeding to avoid underweight (p=0.002) and restriction for health (p= 0.04) than term-born caregivers. Among VLBW children only, pressure was associated with higher nutrition risk ($\beta=2.7$ NutriSTEP[®] points, 95% CI 0.6, 4.8). Pressure ($\beta=-0.5$, 95% CI -0.9, -0.2) and feeding to avoid underweight ($\beta=-0.4$, 95% CI -0.6, 0.1) were associated with lower BMI z-scores and restriction with higher BMI z-scores ($\beta= 0.3$, 95% CI 0.05, 0.6) among VLBW children only.

Conclusions:

VLBW children have high rates of nutrition risk at school-age. Caregiver feeding practices appear predictive of BMI z-scores. Whether these feeding practices are the cause or result of VLBW children's weight requires investigation. Findings underscore the need for nutritional support and anticipatory feeding guidance for these vulnerable children. Funding: CIHR.

O007 / #95

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURETY I
03-31-2023 10:30 - 11:30

EFFECT OF A MULTI-STRAIN PROBIOTIC ON GROWTH AND TIME TO REACH FULL FEEDS IN PRETERM NEONATES

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Background and Aims:

The main nutritional goal for premature neonates is to achieve a postnatal growth rate that the neonate would have experienced in utero. Postnatal growth failure is however very common in very- and extremely low birth weight neonates. The use of probiotics shows promising results in reducing the time to full feeds as well as increased weight gain. The aim of the study was to evaluate the difference in growth and time to reach full feeds between the two treatment arms, using LabinicTM as a multi-strain probiotic and a placebo.

Methods:

We conducted a double-blind, placebo-controlled, randomized clinical trial in Cape Town, South Africa. Male and female preterm neonates, with a birth weight between 750–1500 g and a gestational age <37 weeks were recruited within the first 72 after birth. A probiotic or placebo was given once daily for 28 days. Weight and feeding volume were measured daily and length and head circumference weekly.

Results:

The probiotic group reached full feeds earlier ($p=0.04$) and regained their birthweight earlier ($p=0.06$). From day 21 onwards, the probiotic group showed a significantly greater crude gain in weight ($p < 0.001$). There was a significant improvement observed in the weight Z-score change in the probiotic group over the 28-day period.

Conclusions:

The use of a multi-strain probiotic shows great potential as a low-cost, low risk intervention in reducing the time to reach full feeds as well as shortening the time to

regain birthweight. The probiotic had a beneficial impact on Z-score change in weight potentially decreasing post-natal growth restriction.

O008 / #271

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
03-31-2023 10:30 - 11:30

ASSOCIATION OF PATERNAL BMI AND DIET DURING PREGNANCY WITH OFFSPRING BIRTH MEASURES

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Background and Aims:

Maternal BMI and diet quality and their associated effects on offspring birth measures are well established. Emerging evidence, largely from animal studies, has indicated that paternal factors including diet can influence offspring birth outcomes, however this effect is poorly understood in humans. This study aims to examine the association between paternal body mass index (BMI) and diet quality and offspring birth measures.

Methods:

1,797 mothers, fathers and their neonates volunteered in this study. Paternal BMI was calculated using self-reported weight and height at time of recruitment (10 weeks gestation). Paternal dietary behaviour was assessed using the Index of Diet Quality (IDQ) questionnaire at 30 gestational weeks. Offspring birthweight and birth length z-scores were calculated using the recently published references specific to the Finnish population. Generalised mixed models were carried out to determine associations between paternal factors and offspring birthweight and birth length z-scores, controlling for maternal factors. Statistical analyses were carried out on SPSS V 27.

Results:

Paternal BMI and paternal diet score was not associated with offspring birthweight z-scores. Paternal BMI was not associated with offspring birth length z-scores. Paternal diet score was positively associated with offspring birth length z-scores in unadjusted ($\beta=0.04$, $p < 0.05$) and adjusted models for maternal and paternal factors ($\beta=0.05$, $p < 0.05$).

Conclusions:

Paternal diet score had a positive association with offspring birth length z-scores, with a small positive association seen between father's better adherence to diet and increased birth length in the offspring. This study shows that paternal factors may play a role in other offspring birth measures, including birth length.

ORAL PRESENTATIONS SESSION 01: NEONATAL & PREMATURITY I
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GREATER EFFECTS OF MATERNAL STRESS REDUCTION ON OUTCOMES IN FEMALE LATE PRETERM AND TERM INFANTS: DATA FROM A RANDOMISED CONTROLLED TRIAL

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Background and Aims:

Our recent RCT showed the use of relaxation intervention by mothers breastfeeding a late preterm (LP)/early term (ET) infant can reduce postpartum stress and improve infant weight gain, consistent with greater maternal investment in the infant. This study investigated whether infant sex modified the effect of the relaxation intervention on infant outcomes.

Methods:

Healthy primiparous mother-infant pairs (34^{+0} - 37^{+6} gestation weeks) were randomly assigned to intervention group (IG, listening to relaxation meditation) or control group (CG, no intervention). Infant weight z-score (WAZ) was calculated using 21st Intergrowth data. General linear models were used to test interactions between the intervention and infant sex on changes in WAZ.

Results:

96 participants were recruited (boys=52, girls=44). IG infants showed significantly higher WAZ gain from 1- to 8-weeks than CG. A significant interaction was observed between intervention and infant sex, with higher WAZ gain in intervention girls than boys (change in WAZ 0.93 vs. 0.17, p for interaction=0.032). Mothers of girls used the intervention more frequently than mothers of boys (45 ± 10 vs. 34 ± 16 days, 95%CI -19.5, -2.2), and showed significantly greater increase in breastmilk energy content from 1- to 8-weeks (2.5 ± 4.8 vs. -0.1 ± 3.6 kcal/100ml, mean difference 2.6, 95%CI -5.11, -0.05).

Conclusions:

The findings are consistent with greater maternal investment in girls than boys following the relaxation intervention. However, mothers of girls also used the intervention more frequently, possibly reflecting greater maternal stress in this group due to social norms. The findings need confirmation in larger groups and in other populations.

O010 / #245

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

ASSOCIATION BETWEEN MATERNAL FACTORS AND RISK OF METABOLIC-ASSOCIATED FATTY LIVER DISEASE IN OFFSPRING

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Background and Aims:

Due to increase of obesity, fatty liver disease has become the most common chronic hepatic condition in children. Recently, a simplified definition of metabolic-associated fatty liver disease (MAFLD) was introduced. Maternal factors have been implicated in the development MAFLD, but data remain scarce. We investigated this issue in a case-control study.

Methods:

Data of 460 overweight and obese children aged 2-16 years were collected and combined with data on maternal health during pregnancy and birth. MAFLD was defined as alanine aminotransferase >2x upper limit. Children with and without MAFLD were compared regarding to various maternal factors and pregnancy-related complications. Multivariate regression analysis was utilized.

Results:

Median age of the study participants was 11.8 (quartiles 9.1-14.2) years and 44% were girls. Children with MAFLD (17.8%) were older (12.7 vs 11.6 years, $p=0.002$) and less often overweight before age of 2 years than those without MAFLD, while the groups did not differ in BMI-Z score or gender. In multivariable model considering child related-factors (age, BMI-Z at present, gender and overweight <2 years of age) and maternal factors (smoking, hypertension and pre-eclampsia), child's older age (odds ratio 1.15, 95% confidence interval 1.05-1.26), maternal smoking (1.99, 1.11-3.57), hypertension (3.55, 1.13-11.2) and pre-eclampsia (2.89, 1.13-7.37) were associated with the presence of MAFLD. There was no significant association between MAFLD and maternal BMI, birth anthropometrics or perinatal complications.

Conclusions:

We found maternal smoking, hypertension, and pre-eclampsia during pregnancy to be associated with MAFLD among overweight and obese children. Further prospective studies are needed to verify causal relationships.

O011 / #194

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

LONGITUDINAL BODY COMPOSITION ASSESSMENT USING SKINFOLDS IN CHILDREN

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Background and Aims:

In order to identify children at risk for excess adiposity, it is important to determine body composition longitudinally throughout childhood. However, most frequently-used techniques in research are expensive and time-consuming and, therefore, not feasible in general clinical practice.

Skinfold measurements can be used as proxy for adiposity, but current anthropometry-based-equations have random and systematic errors when used longitudinally in pre-pubertal children. We developed and validated skinfold-based-equations to estimate total fat mass(FM) longitudinally in children aged 0-5 years.

Methods:

This study was embedded in birth cohort Sophia Pluto. In 998 healthy term-born children, we determined anthropometrics, including skinfold measurements, and FM using Air Displacement Plethysmography (ADP) by PEAPOD and Dual energy X-ray Absorptiometry (DXA) longitudinally from birth to age 5 years. Children were randomly divided into a determination and validation cohort.

Linear regression was used to determine the best fitting FM-prediction model based on anthropometric measurements. For validation, we used calibration plots to determine predictive value and agreement between measured and predicted FM. Prediction error was calculated as measured minus predicted FM.

Results:

Three skinfold-based-equations were developed for adjoined age ranges (0-6 months, 6-24 months and 2-5 years), based on FM-trajectories.

Validation of these equations showed significant correlations between measured and predicted FM (R: 0.921, 0.779 and 0.893, respectively) and good agreement with small prediction errors of 1, 24 and -96 grams, respectively.

Conclusions:

We developed and validated reliable skinfold-based-equations which can be used longitudinally from birth to age 5 years in general practice and large epidemiological studies.

O012 / #305

ORAL PRESENTATIONS SESSION 02: OBESITY I
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WHY DO PRECONCEPTION AND PREGNANCY LIFESTYLE INTERVENTIONS DEMONSTRATE LIMITED SUCCESS IN PREVENTING OVERWEIGHT AND OBESITY IN CHILDREN? A SCOPING REVIEW.

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Background and Aims:

Adverse lifestyle factors in the periconception and early life period (e.g., excessive gestational weight gain) are important risk factors for childhood obesity. Early prevention is key, but results from recent reviews of preconception and pregnancy lifestyle interventions have demonstrated mixed success in improving children's weight outcomes. This scoping review therefore aims to investigate the complexity of these interventions, process evaluation components, and authors' statements, to improve our understanding regarding their limited success.

Methods:

A scoping review is currently being conducted, guided by JBI's and Arksey & O'Malley's frameworks. Eligible articles were identified in summer 2022 by searching three electronic databases, consulting previous reviews, and conducting CLUSTER searches. Data extraction and analyses are ongoing. A thematic analysis is being performed in which process evaluation components and authors' interpretations are coded as "reasons". Intervention complexity is being evaluated using the Complexity Assessment Tool for Systematic Reviews.

Results:

28 eligible preconception and/or pregnancy lifestyle trials with child data beyond birth were included. Most interventions started during pregnancy (n=26) and focused on multiple lifestyle factors (e.g., diet, exercise). The preliminary results show that almost no interventions involved the participants' partner or social network. Potential "reasons" for limited success included: timing of start intervention, duration, and sample size. The final results are expected in December 2022 and will be discussed with an expert group as part of a consultation stage.

Conclusions:

The results are expected to uncover gaps and inform the design or adaptation of future interventions and approaches to potentially increase success rates in preventing childhood obesity.

O013 / #373

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

MATERNAL OBESITY AND GESTATIONAL DIABETES AND GLYCEMIC FLUCTUATIONS IN THEIR CHILDREN AT 8.5 YEARS OLD. THE PREOBE STUDY

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Background and Aims:

We aimed to evaluate the long-term effects of maternal obesity and/or gestational diabetes on early programming of glycemic fluctuations during childhood.

Methods:

125 children at 8.5 years old, born to normal weight(n=53), overweight(n=18), obese(n=16) and gestational diabetic(n=37) mothers were evaluated. Anthropometry and body composition were assessed. Glucose metabolic control was registered by 24-hour continuous glucose monitoring (CGM) for an average of 7 days (FreeStyle Glucose FlashMonitoring System). Glycemic variability (GV) was assessed using the multiscale sample entropy (MSE) approach and measures of entropy at various time series were analysed with R software (CGManalyzer package). 3 daily dietary records were obtained and DIAL software was used to obtain macro- & micronutrients intakes. Descriptive, multivariate, partial correlation and multi-scale entropy analyses were performed.

Results:

No significant differences regarding glycemic fluctuations were found between groups at 8.5 years old. Children's BMI and fat mass in those born to obese mothers were higher than those from the other groups (p=0.012). Most anthropometric and body composition variables were positively correlated with glucose entropy in children born to overweight/obese and diabetic mothers (p<0.05). Lipids and calories intake was positively correlated with glucose entropy in children born to diabetic mothers (r=0.39, p=0.021), and negatively correlated in those born to obese mothers (r=-0.40, p=0.032).

Conclusions:

Long-term effects of maternal obesity and/or gestational diabetes on the control of glucose homeostasis during childhood is suggested, associated with children's body composition and dietary intake. The influence of children's dietary intake on glycemic variability was more intense in those born to diabetic mothers.

O014 / #360

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

EARLY PUBERTY IN ISRAELI GIRLS WAS ASSOCIATED WITH BMI BUT NOT SPECIFIC DIETARY FACTORS

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Background and Aims:

A trend towards earlier onset of puberty has been observed globally. This study aimed to investigate associations between age of puberty and demographic, clinical, and nutritional factors among Israeli girls.

Methods:

A cross-sectional, national survey of Israeli children aged 2.0-11.9 years conducted between 2015-2016 (n=1792) provided relevant data. A structured interview with a child's parent or guardian including demographics, obstetric data, health-related behaviors, and 24-hour dietary recall, was carried out. Energy, macronutrient, and selected micronutrient intakes were calculated. Anthropometric measurements were performed by trained personnel. Early puberty was defined as the onset of breast development (thelarche) among girls before age 10. Multivariable logistic regression analysis assessed the relationships between early puberty and associated factors.

Results:

A total of 194 girls were included in the study, 95 of whom were classified as having early puberty, and 99 were controls. As compared to the control group, the early puberty group had lower food insecurity and higher overweight/obesity rates, in addition to lower reported energy consumption, higher birth weight, greater body mass index (BMI), and higher height z-score ($P < 0.05$ for all). Including these potential associated factors, only BMI z-score remained positively associated with early puberty [OR (95%CI) 1.62 (1.1, 2.4)]. No differences were noted between groups for specific dietary components.

Conclusions:

A higher BMI during childhood was associated with earlier puberty onset in girls. No link was found to any specific dietary factor. Potential metabolic mechanisms should be further investigated and the promotion of obesity prevention programs is warranted.

O015 / #182

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

TECHNICAL PERFORMANCE AND USABILITY OF BODY COMPOSITION DETERMINATION USING AIR DISPLACEMENT PLETHYSMOGRAPHY (ADP) IN PEDIATRIC PATIENTS

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Background and Aims:

Body composition is important in pediatric care and research. Air displacement plethysmography (ADP) by use of BODPOD has been validated in small samples of healthy children, but studies in pediatric patients are lacking. We aimed to evaluate the feasibility of BODPOD in different pediatric patient groups and propose recommendations about reliable and valid use.

Methods:

This study was embedded in 7 cohort studies, including healthy term-born children, very preterm-born children (aged 3-5 years), and 5 different pediatric patient-groups (aged 3-18 years). Technical performance and usability, using the User Experience Questionnaire (UEQ) and interviews with involved researchers (n=12), were evaluated. Correlation between anthropometrics and FM% measured by BODPOD was tested in the healthy and preterm-born groups. Longitudinal reference values for fat mass (FM), FM% and fat free mass (FFM) were constructed, using LMS-method, based on 250 healthy term-born children at 3-5 years.

Results:

From 2016-2022, almost 1500 ADP measurements were done. Quality control at calibration technically failed in 16%. ADP was generally rated 'user-friendly', with 'concern about reliability/validity', due to high technical failure-rate and clinically questionable results, especially in very lean children. In very preterm-born children, correlation between BMI SDS and FM% was comparable with those born full-term (R=0.330 and 0.345, both p<0.001). However, 26% of FM% measurements in preterm-born children were unrealistically low (<p2.3 of the constructed reference

values), mainly in children with low BMI SDS and/or bronchopulmonary dysplasia (BPD).

Conclusions:

Caution is needed when using BODPOD for body composition determination in pediatric patients, particularly in those with low BMI.

O016 / #458

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

IMPAIRED GLUCOSE METABOLISM IN YOUNG ADULTS LONG EXPOSED TO OBESITY MIGHT BE THE EXPRESSION OF EARLY AGING PHENOTYPES

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Background and Aims:

Insulin signaling regulates glucose homeostasis and is crucial for metabolism, development, and lifespan. Defects in this signaling pathway led to metabolic alterations, being a pathogenic and proaging factor. In obesity, proinflammatory cytokines and free-fatty acids over-activate the insulin signaling. In subjects long-exposed to obesity, altered expression of glucose-related biomarkers could indicate expression of aging phenotypes. We compared the effect of two obesity subtypes (childhood vs adolescent obesity) on the metabolic profile of 30y-olds

Methods:

Multiple-events case-control study in a Chilean birth-cohort. In n=96, 30y-olds with obesity, weight, height were measured since birth. Glucose insulin, TG, HDL were determined since adolescence. HOMA-IR, HOMA- β , disposition index (DI), TG-HDL ratio and SPISE were computed. Cohen's d coefficient, Cohen's U_3 , overlap and probability of superiority were estimated

Results:

52% had childhood-obesity. Childhood-obesity had a larger effect on glucose (d=.55), HOMA-IR (d=.80), HOMA- β (d=.50), DI (d=.90) and SPISE (d=.62) than adolescent-obesity. Notably, the effect-size-for-difference between obesity subtypes was almost 1 SD for DI. While glucose levels at 30y in participants with childhood obesity were still within normoglycemic values, they were above suggested cutpoints for predicting early-onset type-2 diabetes (≥ 94 mg/dl)

Conclusions:

Effect of childhood-obesity on glucose metabolism in adulthood ranged from moderate (glucose, HOMA- β , SPISE) to large (HOMA-IR, DI). Chronic exposure to obesity could result in expressing both pathogenic and aging phenotypes even in early adulthood. This must be confirmed by measuring trophic factors that activate the proaging insulin signaling. Understanding mechanisms by which obesity at any age limits lifespan will help control aging and age-related diseases. NIH02RHL088530-ACT210006-FONDECYT1210283

O017 / #449

ORAL PRESENTATIONS SESSION 02: OBESITY I
03-31-2023 10:30 - 11:30

PEDIATRIC METABOLIC ASSOCIATED FATTY LIVER DISEASE AT SCHOOL-AGE: RISK FACTORS AND CARDIO-METABOLIC OUTCOMES.

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Background and Aims:

Fatty liver disease, commonly referred to as non-alcoholic fatty liver disease (NAFLD), is the most common chronic liver disease in children. Redefinition of NAFLD into metabolic-associated fatty liver disease (MAFLD), which combines liver fat with adverse cardio-metabolic measures, might have more clinical relevance. We estimated the prevalence of MAFLD and explored risk factors and cardio-metabolic outcomes at school-age.

Methods:

This study was embedded in a population-based prospective cohort study among 1,910 children born in Rotterdam, the Netherlands. At 10 years old, MAFLD was defined as more than 2% liver fat in addition to either excess adiposity, presence of metabolic risk factors or prediabetes. Liver fat fraction was measured using magnetic resonance imaging (MRI). Body mass index, blood pressure, serum lipids and glucose concentrations were assessed through physical examination and blood samples.

Results:

We observed 947 (49.6%) children with more than 2% liver fat, and an overall MAFLD prevalence of 25.5% in our study sample. Compared to children without MAFLD, regardless of liver fat fraction, children with MAFLD had higher odds of Non-European descent and more screen-time (all p-values<0.05). Compared to children with less than 2% liver fat, those with MAFLD had decreased odds of breastfeeding (all p-values<0.05). In children with more than 2% liver fat, those with MAFLD had higher odds of cardio-metabolic risk-factor-clustering (Odds Ratio 9.36 (95% Confidence Interval 5.45, 16.08) than those without.

Conclusions:

Use of MAFLD criteria, rather than percentage of liver fat, might help identify children at risk for adverse cardio-metabolic consequences of increased liver fat from school-age onwards.

O018 / #324

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

A STRUCTURAL EQUATION MODELLING (SEM) STUDY ON PARENTAL SUPPORT INFLUENCE ON MINDFUL EATING AMONG INDONESIAN ADOLESCENT

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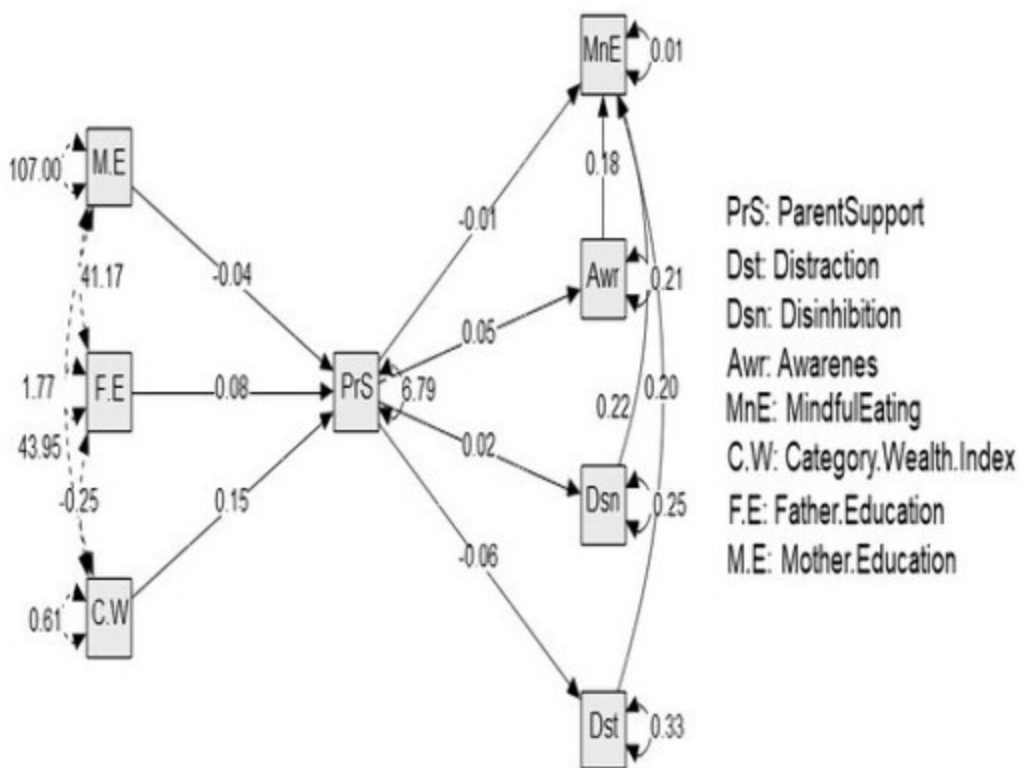
Background and Aims:

Mindful eating interventions have been facilitating improvement in dysregulated eating and dietary patterns among adolescents. Parental support is one of the factors that affect mindful eating in adolescents. The objective of the research is to develop a model of how parental support can influence mindful eating using SEM.

Methods:

This is a cross-sectional study with 169 senior high school students (15–18 years old). The independent variables are parental support, wealth index, parent's education; awareness, distraction, and disinhibition, as the domain of the Mindful Eating Questionnaire (MEQ). While the dependent variable is the mindful eating score. Data analysis used SEM in JASP software to generate coefficient correlation and indirect effect between parental support and mindful eating.

Results:



As a result of this study has been analysed, and it showed the model had acceptable fit indices. The regression analysis revealed that awareness, distraction, and disinhibition, have p-value (<0.001) and correlated with the mindful eating score for

estimate value/coefficient correlation ($r=0.171$), ($r=0.209$) ($r=0.203$) respectively. Based on the path diagram parental support has a significant indirect effect on mindful eating scores mediated by awareness ($\beta = 0.001$) and distraction ($\beta = -0.002$). The fit model has R-square 71.3% of mindful eating score.

Conclusions:

Although three domains (awareness, distraction, and disinhibition) and parental support have a weak correlation with a mindful eating score, but the fit model can explain most of the variance of mindful eating using those four predictors: parental support, awareness, distraction, and disinhibition.

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

CHILDREN WITH CELIAC DISEASE DEMONSTRATE SIGNIFICANT INCREASE IN HEIGHT AND HIGH RATES OF STUNTING NORMALIZATION DURING LONG-TERM FOLLOW-UP

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Background and Aims:

Celiac disease(CeD) may be associated with growth impairment and poor weight gain. Long-term changes in weight and height after CeD is diagnosed, are not well characterized. We aimed to evaluate long-term anthropometric changes in a large cohort of pediatric patients with CeD.

Methods:

Retrospective chart review of patients diagnosed with CeD between the years 1999-2018 in a tertiary pediatric referral center. Demographic and clinical data were collected, and anthropometric measurements were analyzed at diagnosis and during follow-up.

Results:

Study population included 500 patients (59.8% females), diagnosed with CeD at a median (IQR) age of 5.7(3.7-8.9) years. Mean follow up time was 5.5(range 1.5-16.2years). Mean±SD weight-SDS for age(WAZ) and height-SDS for age(HAZ) have increased significantly from -0.82±1.21 and -0.73±1.16 at diagnosis to -0.37±1.75 and -0.15±1 at end of follow-up, respectively (p<0.001). The highest changes were observed in patients diagnosed before 3 years of age compared to older age-groups, with mean change in WAZ and HAZ of 0.98±1.09 and 0.63±0.72, respectively (p<0.001). At diagnosis, wasting and stunting were identified in 19.7% and 16.4% of the cohort. Wasting and stunting were normalized in 77.3% and 64.8% within a median(IQR) time of 0.79(0.42-4.24) and 2.3(0.72-6.02)years, respectively. Age at diagnosis, gender, gluten-free diet adherence, and frequency of visits were not associated with rate of wasting or stunting normalization.

Conclusions:

Over a long-term follow-up, pediatric CeD patients demonstrate significant increases in weight and height for-age. Younger age at diagnosis is associated with higher magnitude of both weight gain and linear growth, emphasizing the importance of early diagnosis of CeD.

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

THRESHOLD EFFECT: FASTER REHABILITATION WEIGHT GAIN DURING TREATMENT FOR SEVERE MALNUTRITION IN CHILDHOOD IS ASSOCIATED WITH ADULT ADIPOSITY

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Background and Aims:

Nutritional rehabilitation during severe malnutrition (SM) in childhood is aimed at restoring body size quickly and minimizing poor short-term outcomes. We hypothesized that too rapid weight gain during treatment could predispose to cardiometabolic risk in adult life.

Methods:

Weight and height during hospitalization were abstracted from hospital records of children who survived SM. Post-malnutrition weight gain was defined as: change in weight-for-age z-scores/day (Δ WAZ/day), g/day and g/kg/day. These variables were analyzed as quintiles and continuous variables in age, sex and minimum WAZ-adjusted regression models against adult anthropometry, body composition (DEXA), blood pressure, blood glucose, insulin, and lipids.

Results:

60% of 278 participants were male, mean (SD) age 28.2 (7.7) years, mean (SD) BMI 23.6 (5.2) kg/m². Mean admission age for SM was 10.9 months (range 0.3-36.3 months) and 207/270 (77%) were wasted (weight-for-height z-score < -2). During hospitalization, mean rehabilitation weight gain (SD) was 0.07 (0.03) Δ WAZ/day, 62 (25) g/day and 10.1(3.8) g/kg/day. Rehabilitation weight gain >0.09 WAZ/day was associated with higher adult BMI, waist circumference (WC), fat mass (FM) and %

FM and lean mass (LM) ($p < 0.05$) while > 81 g/day was associated with higher adult WC and LM. Rehabilitation weight gain > 12.9 g/kg/day was associated with higher adult BMI, WC, FM, FM index, android fat mass and % android fat mass ($p < 0.05$).

Conclusions:

Rehabilitation weight gain exceeding 0.09 WAZ/day and 13g/kg/day were associated with adult adiposity in young, normal-weight adult SM survivors. This raises questions around existing malnutrition weight gain targets and warrants further studies exploring optimal post-malnutrition weight gain.

O021 / #77

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

ASSOCIATIONS OF CARDIORESPIRATORY FITNESS, SCREEN TIME AND MENTAL HEALTH AMONG CHINESE SCHOOL CHILDREN

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Background and Aims:

Mental disorders affect many children worldwide. This study aimed to assess the independent and joint associations between cardiorespiratory fitness (CRF), screen time (ST) and mental health among Chinese school-aged children.

Methods:

A cross-sectional study was conducted in three primary schools in Wuhan city, China. Children self-reported ST, and their height, weight and CRF were measured. Mental health (anxiety, depressive symptom, and self-esteem) was assessed by self-administered standard questionnaires.

Results:

A total of 805 children aged 9.1 ± 0.6 years participated in this study. High ST was associated with significantly increased risk for anxiety and low self-esteem, while high CRF was associated with decreased risk of low self-esteem. In the joint model, Children with low ST and high CRF showed the lowest risk for anxiety (OR: 0.42, 95%CI:0.20-0.89) and low self-esteem (OR:0.40, 95%CI:0.23-0.69).

Conclusions:

High ST and low CRF were negatively associated with mental health in Chinese schoolchildren. Health care and interventions on limiting ST and improving CRF level are warranted to promote the mental health in this population.

O022 / #261

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

PREDICTORS OF ESSENTIAL FATTY ACID DEFICIENCY IN 6-18-YEAR OLD UGANDAN CHILDREN WITH VARYING LEVELS OF HIV EXPOSURE AND INFECTION

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Background and Aims:

Children in low-middle-income countries are susceptible to nutritional deficiencies, such as Essential Fatty Acid Deficiency (EFAD), which adversely impact developmental trajectory. The prevalence of EFAD in vulnerable African children with and without HIV infection/exposure is unknown. Hence, we determine the prevalence of EFAD and identify its correlates at 6-18 years old in 628 Ugandan children that were perinatally HIV infected (CPHIV, n=212), HIV exposed uninfected (CHEU, n=211) or HIV unexposed uninfected (CHUU, n=203).

Methods:

EFAD was defined per the ratio of triene to tetraene in serum as present (if triene:tetraene >0.02) or absent (if triene:tetraene ≤0.02). Sociodemographic, lifestyle, and health factors were recorded for children and caregivers. Bivariate logistic regressions were used to analyze the associations between EFAD status and covariates using R.

Results:

In this sample, EFAD was highly prevalent (57%, n=355). Older age of child (OR=2.33, 95% CI: 2.04,2.66), depressive symptoms in caregivers (OR=1.68, 95% CI: 1.19,2.36), caregiver none or low formal education (OR=1.80, 95% CI: 1.28,2.53), and low or unskilled occupational status (OR=1.69, 95% CI: 1.12-2.55) predicted EFAD. There were no significant group differences in EFAD by HIV status (CPHIV: OR= 1.19, 95% CI: 0.81,1.76; CHEU: OR= 1.28 95% CI: 0.87,1.89), CHUU: reference group).

Conclusions:

The strongest predictors of EFAD were age, socioeconomic status, and caregiver depression. These data suggest that children should be targeted for mitigation of EFAD as they get older, and promising pathways for intervention include a combination of educational awareness, psychosocial interventions to mitigate depression, and economic opportunities to ensure sustainable access to high quality nutrition.

O023 / #369

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

ADHD IN ADOLESCENTS IS ASSOCIATED WITH LOWER HEIGHT BUT NOT WITH OVERWEIGHT/OBESITY - RESULTS FROM THE ISRAELI NATIONAL HEALTH SURVEY

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Background and Aims:

Evidence suggests that attention-deficit hyperactivity disorder (ADHD) and its pharmacotherapy treatment are associated with elevated risk for obesity and short stature in childhood. This study examined these associations among adolescents.

Methods:

Participants in the Israeli Youth Health and Nutrition Survey (2015-2016), a cross-sectional school-based study, completed self-administered questionnaires, and anthropometric measurements were collected. Body mass index (BMI) and height z-scores were calculated using WHO growth standards. Overweight/obesity (BMI z-score \geq 1) and lower height (LH) [Height z-score $<$ -0.7 (<25th percentile)] were determined. Multivariable logistic regression analyses assessed the associations between ADHD and related factors.

Results:

Out of 4173 study participants (ages 11-18 y, 50.2% males), 654 reported ever being diagnosed with ADHD. Overweight/obesity was noted in 31% of participants. No differences were found in either BMI z-scores or weight status between ADHD and non-ADHD adolescents. Nevertheless, ADHD adolescents had a slightly lower mean height z-score, and a significantly higher prevalence of LH compared to the control group. Controlling for potential covariates (demographic, lifestyle, and dietary intake characteristics) the association between ADHD and LH remained significant [OR (95%): 1.28 (1.03, 1.58)]. Stimulant-treated ADHD adolescents (n=252) had similar weight and height indicators, dietary intakes, and lifestyle as those not treated.

Conclusions:

ADHD is associated with LH. Height deficit may be intrinsic to this disorder, rather than a result of these adolescents' diet or lifestyle alone. Further studies are needed to determine the causality between ADHD and short stature.

O024 / #308

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

IS UNDERWEIGHT ASSOCIATED WITH POORER DIET, NUTRITIONAL STATUS, BONE AND CARDIOMETABOLIC HEALTH, AND SCHOOL PERFORMANCE IN DANISH 8-11-YEAR-OLDS?

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Background and Aims:

Underweight or low BMI is largely overlooked among children in high-income countries, despite the well-known negative health impacts of underweight in low-income countries. We investigated if dietary intake, nutritional status, bone and cardiometabolic health as well as school performance differed in Danish children with underweight compared to normal- and overweight.

Methods:

We used cross-sectional data from 815 Danish 8-11-year-old schoolchildren. Measurements included 7-day dietary records, anthropometry, bone mineralization by DXA scans, and tests of attention and school performance, as well as analysis of nutritional and cardiometabolic biomarkers in fasting blood samples. We defined underweight according to the IOTF BMI cut-offs.

Results:

Among the 815 included children, 83 (10.2%) had underweight (boys: 8.9%; girls: 11.6%, $P=0.391$) of mainly grade 1. Children with underweight had a 387 kJ/d (95% CI: -697;-77) lower mean energy intake, lower intake of protein and meat and higher intake of added sugar and fish, compared to normalweight. Furthermore, children with underweight had lower bone mineral density, content and area and lower insulin and IGF-1 compared to those with normalweight, whereas serum LDL-C and TAG was lower and HDL-C was higher only when compared to overweight. We found no difference in nutritional biomarkers or school performance.

Conclusions:

In a Danish high-income setting, children with underweight had a different dietary pattern, lower bone mineralization and growth factors than those with normalweight, but comparable nutritional status and lipid profile, which was mainly affected in children with overweight. The observed differences are likely attributable to the lower growth and mechanical weight load of underweight.

O025 / #403

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

NEURODEVELOPMENTAL, COGNITIVE, BEHAVIOURAL AND MENTAL HEALTH IMPAIRMENTS FOLLOWING CHILDHOOD MALNUTRITION: A SYSTEMATIC REVIEW

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Background and Aims:

Severe childhood malnutrition impairs growth and development short-term, but current understanding of long-term outcomes is limited. We aimed to identify studies assessing neurodevelopmental, cognitive, behavioural and mental health outcomes following childhood malnutrition.

Methods:

We systematically searched for studies assessing outcomes in those exposed to childhood malnutrition in low-income and middle-income settings. We used guidelines for synthesis of results without meta-analysis to analyse three outcome areas: neurodevelopment, cognition/academic achievement, behaviour/mental health.

Results:

We identified 30 studies, including some cohorts reporting outcomes through to adulthood. There is strong evidence that malnutrition in childhood negatively impacts neurodevelopment based on high-quality studies using validated neurodevelopmental assessment tools. There is also strong evidence that malnutrition impairs academic achievement with agreement across seven studies investigating this outcome. Eight of 11 studies showed an association between childhood malnutrition and impaired cognition. This moderate evidence is limited by some studies failing to measure important confounders. Five of 7 studies found a difference in behavioural assessment scores in those exposed to childhood malnutrition compared with controls but this moderate evidence is similarly limited. Mental health impacts were difficult to ascertain due to few studies with mixed results.

Conclusions:

Childhood malnutrition is associated with impaired neurodevelopment, academic achievement, cognition and behavioural problems but evidence regarding mental health is inconclusive. Future research should explore the interplay of childhood and later-life adversities on these outcomes. While evidence on nutritional and clinical therapies to reduce long-term risks is also needed, preventing and eliminating child malnutrition is likely to be the best way of preventing long-term neurocognitive harms.

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

GENDER DIFFERENCES IN BODY COMPOSITION AND METABOLIC SYNDROME COMPONENTS IN TREATMENT NAÏVE TRANSGENDER/GENDER DIVERSE ADOLESCENTS

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Background and Aims:

Transgender/gender diverse (TGD) youth are more susceptible to mental health issues, eating disorders, and decreased involvement in recreational activities. Gender-affirming hormone treatment (GAHT) in TGD people may increase their risk for cardiometabolic alterations. We thought to explore the weight status, body composition and metabolic syndrome components (Mets) in TGD adolescents prior to GAHT.

Methods:

This observational study included 43 transfemale (birth-assigned male) and 83 transmale (birth-assigned female) treatment-naïve adolescents (age 15.4±2.3 years). Body composition was measured by bioimpedance-analysis (Tanita MC-780MA) by birth-assigned sex and muscle-to-fat (MFR) z-scores were calculated.

Results:

Distribution of weight categories differed between genders ($P < 0.001$), with a greater proportion of underweight in transfemales (16.3% vs 4.8%) and a greater proportion of overweight/obese/severe-obese in transmales (34.9% vs 18.6%). Comparison between transfemales and transmales revealed lower mean BMI z-scores (-0.30 ± 1.34 vs 0.54 ± 1.24 , $P = 0.001$) and higher MFR z-scores (-0.18 ± 1.14 vs -0.72 ± 0.90 , $P = 0.004$). Sixty nine percent of TGD adolescents had at least one MetS component; with a greater number and frequency of MetS components in transmales ($P = 0.05$). Distribution of Mets components differed between genders, with a greater proportion of elevated BP levels/hypertension in transfemales ($P = 0.006$) and higher rates of

dyslipidemia – elevated triglycerides ($P=0.013$) and low HDL-c ($P<0.001$) in transmales.

Conclusions:

Conclusions: Our findings suggest that TGD youth are at risk for unfavorable weight status and cardiometabolic alterations prior to gender-affirming hormone therapy. Medical nutrition intervention is warranted in this group of treatment-naïve individuals in attempts to promote future good cardiometabolic health outcomes.

O027 / #408

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

PROTEIN-CALORIE MALNOURISHMENT IN EARLY LIFE INCREASES SUSCEPTIBILITY TO CHEMOTHERAPY-RELATED TOXICITY IN RATS

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Advanced Centre for Treatment, Research, and Education in Cancer, Department Of Clinical Pharmacology, Navi Mumbai, Maharashtra, India

Background and Aims:

Malnutrition can increase a child's susceptibility to cancer treatment-related toxicity. We aimed to study the effect of malnutrition on cardiotoxicity of doxorubicin.

Methods:

Protein-energy malnutrition (PEM) model was developed by feeding rats with 8% protein diet whereas 16% protein feed was used as control diet (CD). Both groups were treated with either doxorubicin (3mg/kgX5)/saline over a period of three weeks. Cardiac changes were evaluated using FDG uptake in heart, histology, western blotting of ROS enzymes, autophagy markers, and apoptosis markers.

Results:

Doxorubicin-treated PEM rats (PEM-T) suffered nose bleeds (8/10) and decreased food consumption. We observed higher mortality in PEM-T as compared to doxorubicin-treated CD rats (CD-T) (5/10 vs 0/10). Higher cardiac FDG uptake was noted in PEM-T as compared to CD-T or the saline treated groups (CD-S, PEM-S). Histopathological analysis revealed increased degenerative changes in PEM-T as compared to CD-T particularly in heart and spleen. In heart lysates, the concentration of doxorubicin and its metabolite-doxorubicinol was significantly higher in PEM-T as compared to CD-T (99.12±10.23 vs 57.48±3.770, p-value-0.0019 and 143.9±15.11 vs 84.75±6.405, p-value-0.0029 respectively). Both CD-T and PEM-T showed increased expression of autophagy-related gene, p62 but decreased LC-3 II/LC-I ratio with a concomitant decrease in ATG4 gene as compared to CD-S and PEM-S. Furthermore, significantly higher levels of SOD1 and GPx4 was observed in CD-T and PEM-T as compared to CD-S and PEM-S.

Conclusions:

We conclude that moderate malnutrition increases susceptibility to doxorubicin-related toxicity. These findings suggest need for dose-optimization of anticancer drugs in malnourished patients.

O028 / #155

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

ANTHROPOMETRIC AND BODY COMPOSITION TRAJECTORIES OF PICKY-EATER CHILDREN SUPPLEMENTED FOR 6 MONTHS: A RANDOMIZED CONTROLLED CLINICAL TRIAL

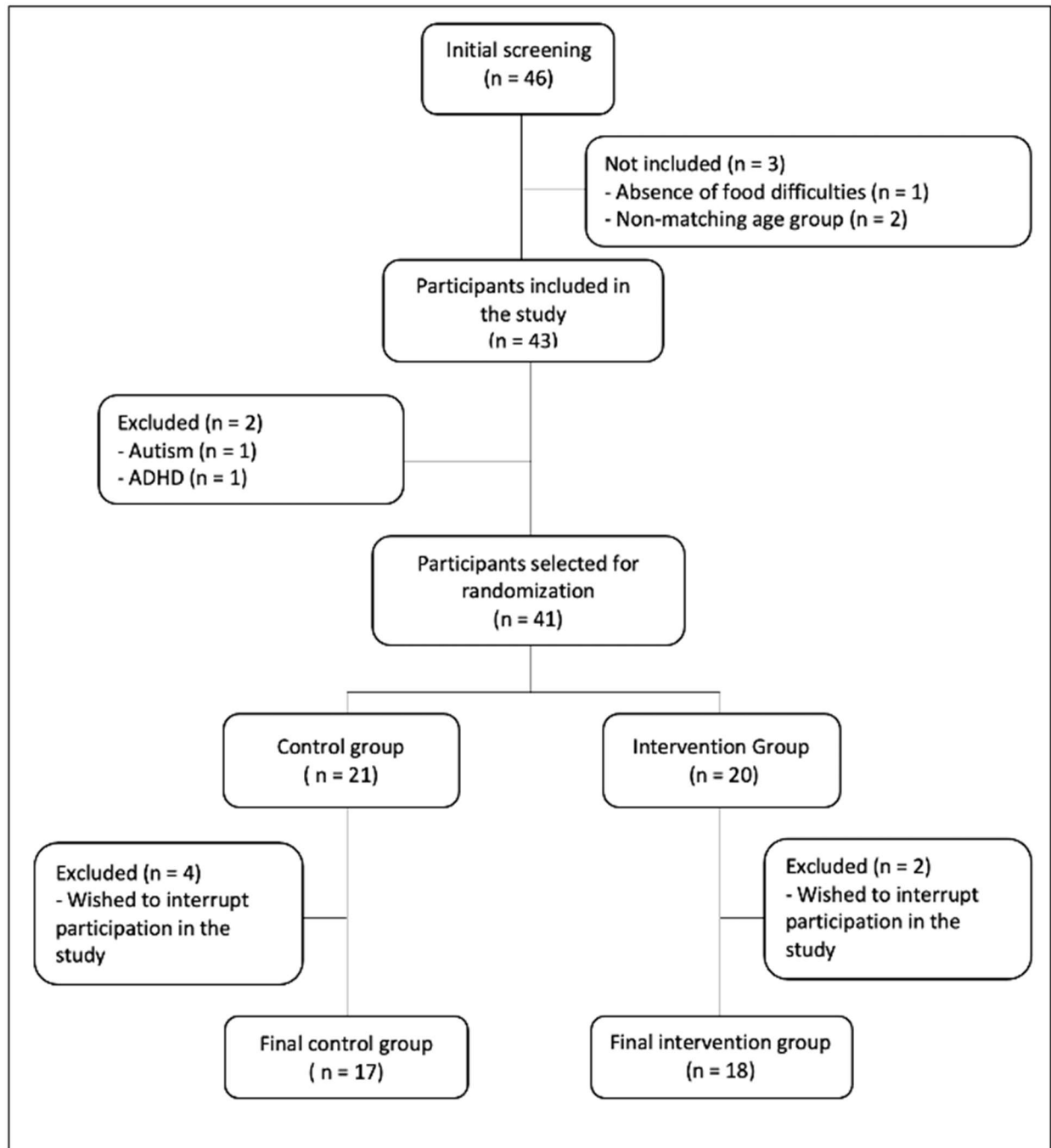
Carlos Alberto Nogueira-De-Almeida¹, Fábio Da Veiga Ued², Luiz Antonio Del Ciampo³, Maria Eduarda Nogueira-De-Almeida², Andrea Aparecida Contini¹, Ivan Savioli Ferraz³, Edson Zangiacomi Martinez⁴
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Background and Aims:

Picky-eating is prevalent and always approached through food reeducation. Nutritional supplementation is often used to minimize nutritional risk and promote catch-up growth, but there is concern regarding possible excessive weight gain. The present study aimed to evaluate the evolution of weight, height, body mass index (BMI) z-scores and body fat percentage (BFP) of picky-eater children supplemented for 6 months.

Methods:

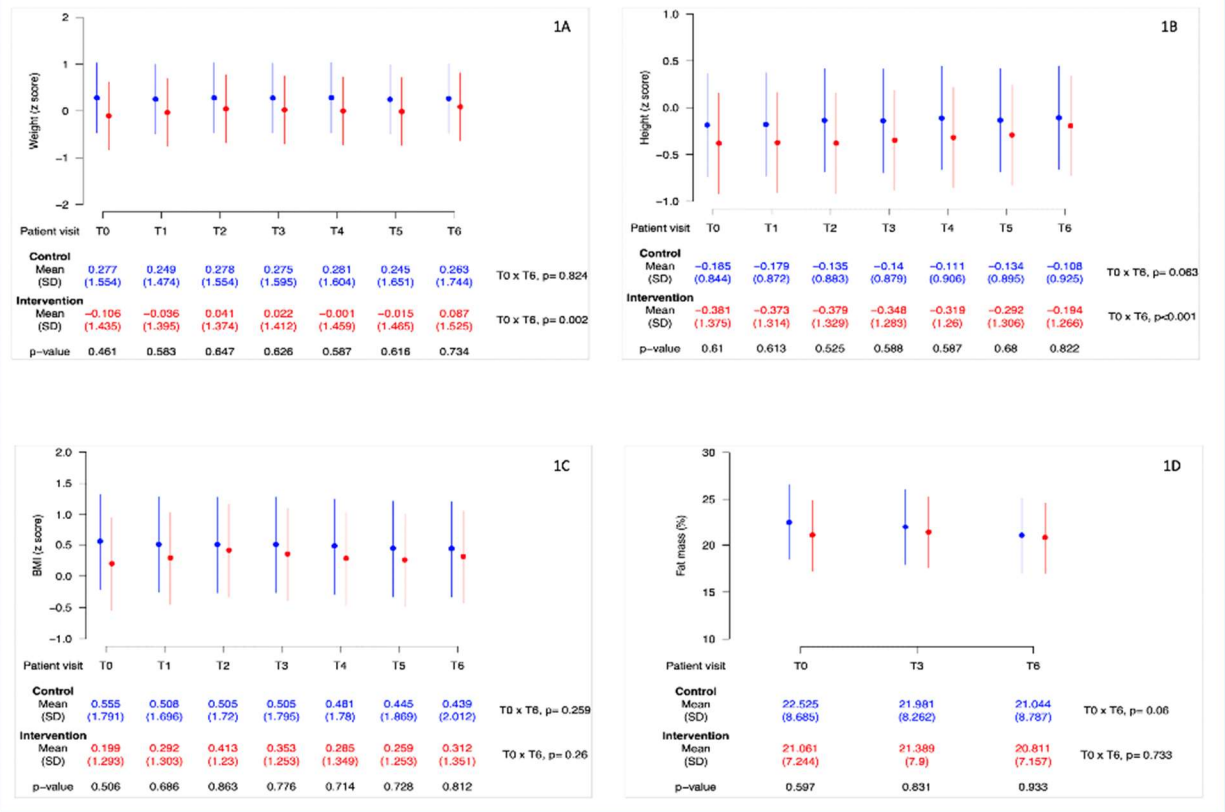
Randomized controlled trial enrolling 35 eutrophic picky-eater children (2 to 5 years), randomized in 2 groups: intervention (IG) and control (CG). Both were followed for 6 months, with monthly visits and standardized nutritional orientations. Weight and height were accessed monthly and BFP quarterly using bioimpedanciometry. IG additionally received prescription of 400 ml/day of supplement containing 1 kcal/ml, 54% carbohydrates, 34% lipids, 12% protein and micronutrients. Composition of study groups is shown below.



Results:

Baseline data showed no differences between groups. Trajectories of weight, height, BMI z-scores and BFP are shown in figure 1. During the six visits, all indicators remained statistically similar for IG and CG. Within groups, for CG, no differences were observed between T0 and T6. For IG, weight and height increased their z-scores, while BMI and BFP remained unchanged.

Figure 1 – weight z-scores (1A), height z-scores (1B), BMI z-scores (1C) and fat mass percentage (1D) trajectories during 6 months intervention trial



Conclusions:

Picky-eater children supplemented did not gain excess fat. They increased their weight not by gaining fat, but due to increase in stature, as shown by BMI z-score and BFP, that remained unchanged. It's possible that growth of these picky eater children was retained because of the nutrition profile of their eating behavior and supplementation was able to promote catch-up growth.

A STUDY ON THE RELATIONSHIP OF SLEEP DURATION AND SCREEN TIME WITH MENTAL HEALTH AMONG ADOLESCENTS IN WUHAN

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Background and Aims:

At present, there are few studies on the combined effects of sleep duration (SD) and screen time (ST) on adolescents' mental health. This study analyzed the status of ST and SD among adolescents in Wuhan and their associations with anxiety and depression symptoms.

Methods:

A stratified cluster random sampling method was used to investigate SD, ST, depression and anxiety symptoms among 1193 students from 5 middle schools in Xinzhou District of Wuhan in November 2021. Logistic regression was used to analyze the effects of SD, ST and their combination on adolescents' mental health.

Results:

Among the participants, 989 (82.9%) did not have enough SD, 617 (51.7%) reported long ST, 272 (34.9%) had depressive symptoms, and 416 (22.8%) had anxiety symptoms. Logistic regression analysis showed that the ORs (95%CI) of ST associated with depression and anxiety symptoms were 1.32 (1.01-1.72) and 1.40 (1.02-1.92), respectively; whereas of SD was 1.52 (1.04-2.21) and 1.11 (0.73-1.69), respectively. After controlling for confounding factors, the odd of depression and anxiety was 1.83 (95%CI=1.01-3.33) and 2.20 (95%CI=1.02-4.73) for adolescents with SD and ST below the recommended criteria, respectively.

Conclusions:

Adolescents in Wuhan had a high prevalence of depressive symptoms and anxiety symptoms, while the sleep time was seriously insufficient, and more than half of the students spent too much time on screen. Lack of SD and long ST significantly increased the risk of depression and anxiety symptoms in adolescents.

O030 / #178

ORAL PRESENTATIONS SESSION 03: CHILDHOOD & ADOLESCENCE I
03-31-2023 15:45 - 17:15

EFFECT OF MILK PROTEIN AND WHEY PERMEATE IN LIPID-BASED NUTRIENT SUPPLEMENT ON LINEAR GROWTH AND BODY COMPOSITION AMONG STUNTED UGANDAN CHILDREN: A RANDOMISED 2X2 TRIAL

Benedikte Grenov¹, Joseph Mbabazi², Hannah Pesu¹, Rolland Mutumba², Suzanne Filteau³, Jack I Lewis¹, Jonathan Wells⁴, Mette Frahm Olsen⁵, Andre Briend¹, Kim Fleischer F. Michaelsen¹, Christian Mølgaard¹, Christian Ritz⁶, Nicolette Nabukeera-Barungi², Ezekiel Mupere², Henrik Friis¹

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Background and Aims:

Foods for undernourished children often contain milk. We aimed to assess effects of milk protein (MP) and whey permeate (WP) in lipid-based nutrient supplement (LNS), and of LNS itself, on linear growth and body composition among stunted children.

Methods:

1-5-year-old children were randomised to 100 g LNS/day for 12 weeks with MP vs soy protein and/or WP vs maltodextrin (2x2 factorial trial), or to no supplementation. Primary outcomes were change in height and knee-heel length, and secondary outcomes included body composition based on bioimpedance.

Results:

Of 750 children enrolled, 736 completed 12-weeks' follow-up. Mean height-for-age z-score (HAZ) was -3.02 ± 0.74 . There were no effects of MP or WP on height, knee-heel length or body composition ($p > 0.05$). However, intake of LNS increased height by 0.56 (95%CI: 0.42; 0.70) cm corresponding to 0.17 (0.13; 0.21) HAZ and increased weight by 0.21 (0.14; 0.28) kg, of which 76.5% (61.9; 91.1) was fat-free mass. When expressed independently of height as indices, LNS resulted in a 0.07 (0.0001; 0.13) kg/m^2 increase in fat-free mass index (FFMI), but not in fat mass index (FMI) (0.01 kg/m^2 , 95%CI: -0.10; 0.12). Unsupplemented children declined in HAZ, increased in FMI, but tended to decline in FFMI.

Conclusions:

Milk ingredients in LNS had no additional effects compared to high quality soy protein on linear growth or body composition. However, supplementation with LNS supported linear catch-up growth and accretion of fat-free mass, but not fat mass. Since stunted children gain fat at the expense of fat-free mass if left untreated, programmes to treat stunting should be considered

O031 / #333

ORAL PRESENTATIONS SESSION 04: OTHER
04-01-2023 10:30 - 11:30

GASTRIC CASEIN COAGULATION AND POSTPRANDIAL AMINO ACID ABSORPTION OF MILK IS AFFECTED BY MINERAL COMPOSITION: A RANDOMIZED CROSSOVER TRIAL

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Background and Aims:

In vitro studies suggest that gastric casein coagulation and digestion of milk formula under simulated infant conditions is affected by casein micelle mineralisation. Casein micelle mineralisation may thus also impact overall digestion and absorption kinetics in vivo. This study therefore aimed to determine the effect of milk casein micelle mineralisation on milk protein digestion and absorption.

Methods:

In a randomized cross-over study healthy males (n =15, age 30.9±13.8 years) were fed low or high casein micelle mineralization milk and underwent gastric magnetic resonance imaging (MRI) scans to determine gastric emptying and the degree of casein coagulation. Blood samples were taken at baseline and up to 5 hours postprandially to determine amino acid absorption kinetics and changes in plasma insulin and glucose.

Results:

MRI analyses showed that gastric volume over time did not differ between treatments. However, the degree of casein coagulation was lower for low mineralization milk. Postprandial plasma amino acid kinetics showed that casein-dominant amino acids, such as proline, differed significantly between treatments whereas whey-dominant amino acids, such as leucine, did not. Plasma insulin responses were in line with an initial higher level of branched-chain amino acids in the low mineralization condition although only valine was significantly different.

Conclusions:

Mineral composition of milk can influence gastric coagulation with coherent effects on post prandial plasma amino acid kinetics and plasma insulin responses without impacting overall gastric emptying.

O032 / #74

ORAL PRESENTATIONS SESSION 04: OTHER
04-01-2023 10:30 - 11:30

BLENDERIZED TUBE FEEDING FOR CHILDREN: A SYSTEMATIC REVIEW OF THE IMPACT ON UPPER GASTRO-INTESTINAL SYMPTOMS

Hanne Delcourt¹, Lize De Belder², Raquel Van Den Eynde², Koen Huysentruyt³

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Background and Aims:

Blenderized tube feeding (BTF) is on the rise among children who require enteral nutrition but the impact on health benefits is not clearly defined. Therefore, we aimed to perform a systematic review on the evidence of BTF on health outcomes. The primary aim was to determine the effect of BTF on upper gastro-intestinal (UGI) symptoms in pediatric patients.

Methods:

A systematic review was performed by searching 4 databases (MEDLINE, EMBASE, Cochrane trials and LILACS) for randomised controlled trials (RCT), prospective and retrospective cohort studies and cross-sectional studies reporting on health outcomes in children on BTF (PROSPERO CRD42022306237). No language restrictions were used. Quality assessment was done using the ROBINS-I tool.

Results:

A total of 2573 studies were screened on title and abstract. In total, 8 studies (422 patients) fulfilled the inclusion criteria and reported on health outcomes while on BTF. Overall the risk of bias was high. No RCT met the inclusion criteria. All cohort studies reported an improvement in UGI symptoms. An increased oral intake was observed in four studies (40 patients). Three studies reported a decline in the use of acid reduction medication.

Conclusions:

There is a lack of high quality research on the health outcomes of BTF. The current available evidence shows that BTF might improve GI symptoms and oral intake.

O033 / #301

ORAL PRESENTATIONS SESSION 04: OTHER
04-01-2023 10:30 - 11:30

MICRONUTRIENT INTAKE COMPLIANCE, DIETARY HABITS, AND FOOD TABOOS AMONG PREGNANT WOMEN IN NSUKKA: A DESCRIPTIVE CROSS-SECTIONAL STUDY

Aloysius Nwabugo Maduforo^{1,2}, Justina Ndirika Chikwendu², Clementina Ebere Okoro^{2,3}, Amaka Laura Konwea², Chizoba Lilian Steve-Edemba^{2,4}, Miracle Chikadibia Aloysius-Maduforo⁵

¹University of Calgary, Educational Research (leadership), Werklund School Of Education, Calgary, Canada, ²University of Nigeria, Nsukka, Department Of Nutrition And Dietetics, Nsukka, Nigeria, ³FCT Primary Healthcare Board, Nutrition Section, ABUJA, Nigeria, ⁴UNICEF, Nutrition, Abuja, Nigeria, ⁵University of Calgary, Faculty Of Science, Calgary, Canada

Background and Aims:

Micronutrients are recommended for pregnant women to routinely take during pregnancy to supplement the ones supplied by diet as well as prevent the negative consequences micronutrient deficiency. This study assessed the dietary habit, food taboos, and compliance to micronutrient intake among pregnant women attending ante-natal clinic in Nsukka Local Government.

Methods:

The study design was facility-based cross-sectional survey. The population used for the study were pregnant women attending ante-natal care. Seven health care centers in Nsukka Local Government were selected for the study. A structured and validated questionnaire was used to elicit information from 340 participants. The socio-demographic, dietary habit, food taboos, and compliance to micronutrient were assessed. The data was analyzed using descriptive statistics.

Results:

The result of the study showed that the respondents who craved specific food substances were 36.5% and those that had no cravings were 63.5%. Food taboos among respondents were 13.5% and those without food taboos were 86.5%. All 340 respondents take routine micronutrient supplements, 69.1% comply to those drugs while 30.9% do not comply. Pregnant women with low dietary diversity were 32% and 2.6% high dietary diversity.

Conclusions:

Nutrition in the first one thousand days starts from conception until the child is two years. This study showed that majority of the pregnant women did not have high dietary diversity, and many does not comply with micronutrient intake.

O034 / #471

ORAL PRESENTATIONS SESSION 04: OTHER
04-01-2023 10:30 - 11:30

DIETARY DIVERSITY AMONG HIV-EXPOSED AND UNINFECTED COMPARED TO HIV-UNEXPOSED AND UNINFECTED CHILDREN AGED 32-59 MONTHS IN GAUTENG, SOUTH AFRICA.

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Background and Aims:

Little is known about HIV-exposed uninfected (HEU) feeding practices compared to HIV-unexposed and uninfected (HUU) children. We assessed factors associated with dietary diversity among HEU and HUU children in Gauteng, South Africa.

Methods:

We tracked 124 mother-baby pairs (62.1% HEU) between 07/2020–02/2021 from a sub-set of 1150 enrolled in the PEAD-Link trial one week after delivery from 10/2016–02/2018. Household dietary diversity (HDD) and child dietary diversity (CDD) were determined by summing unique food groups consumed in the preceding 24 hours. We categorized CDD into inadequate (CDD <4) and adequate (CDD ≥4) based on the minimum acceptable dietary diversity recommended by the WHO. HDD was categorized as inadequate (HDD <6) and adequate (HDD ≥6). Modified Poisson regression, reporting crude prevalence ratios (PR), was used to evaluate CDD and HDD predictors.

Results:

Overall, 9.7% of children had inadequate CDD, 8.5% HUU and 10.4% HEU; and 23.4% resided in households with inadequate HDD (31.9% HUU vs 18.2% HEU). Predictors of inadequate CDD were low maternal literacy (PR 2.9, 95%CI: 1.0-8.3), inadequate HDD (PR 9.8, 95%CI: 2.8-34.1), ≥3 children in the household (PR 3.1 vs 1-2 Children, 95 %CI: 1.0-9.1). Predictors of inadequate HDD were low maternal literacy (PR 2.0, 95%CI: 1.1-3.8), living in a secondary home (PR 2.0 vs primary home, 95 %CI: 1.0-3.8), and ≥2 adults in the household (PR 0.2 vs 1 adult, 95 %CI: 0.1-0.4).

Conclusions:

Nutrition education programs should be tailored to mothers' literacy levels. Child dietary diversity may be most impacted by interventions to improve household nutritional status.

O035 / #465

ORAL PRESENTATIONS SESSION 04: OTHER
04-01-2023 10:30 - 11:30

INTEGRATED CHILD DEVELOPMENT SERVICE (ICDS) COVERAGE AMONG SEVERE ACUTE MALNOURISHED (SAM) CHILDREN IN INDIA: A MULTILEVEL ANALYSIS BASED ON NATIONAL FAMILY HEALTH SURVEY 5

Ritankar Chakraborty¹, William Joe²

¹INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES, Dept Of Biostatistics And Epidemiology, MUMBAI, India, ²Institute of Economic Growth, Population Research Centre, Delhi, India

Background and Aims:

Severe acute malnutrition (SAM) is fatal for children, and those who survive are maimed both intellectually and physically. The last three National Family Health Survey (NFHS) in India shows an increase in the prevalence of SAM among under-five children. Given the specific mandates under ICDS (Integrated Child Development Service) for SAM children, it is important to validate the coverage efficiency of ICDS on SAM children. Therefore, this is an attempt at examining the possible association between the coverage efficiency of ICDS on SAM children. This study also tries to find out the determinants of ICDS service utilization among SAM children.

Methods:

The study uses data from the National Family Health Survey 5. Descriptive statistics and Multilevel Logistic Regression was used to identify the determinants of ICDS service utilization among SAM children.

Results:

The burden of SAM is more among older children (3+ age). Coverage of ICDS was more among younger children and among the poorest households in the rural areas. Age had a significant relationship with SAM coverage under ICDS. Pregnant and lactating mothers who received ICDS services were significant determinants of SAM coverage under ICDS.

Conclusions:

There is no evidence that ICDS is more efficient in identifying and covering SAM children than other non-SAM children. Despite special provisioning in place for SAM

children, coverage of different ICDS services was similar to that of non-SAM children. The study suggests that improving coverage of ICDS services among pregnant and lactating mothers would increase the coverage of ICDS services among SAM children.

O036 / #497

ORAL PRESENTATIONS SESSION 04: OTHER
04-01-2023 10:30 - 11:30

NUTRITIONAL INEQUALITIES AMONG UNDER-FIVE CHILDREN: A GEOSPATIAL ANALYSIS OF HOTSPOTS AND COLD SPOTS IN 73 LOW- AND MIDDLE-INCOME COUNTRIES

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Background and Aims:

Child undernutrition is a severe health problem in the developing world, which affects children's development in the long term. This study analyses the extent and patterns of under-five child undernutrition using Demographic and Health Surveys (DHS) for 73 low- and middle-income countries (LMICs).

Methods:

First, we mapped the prevalence of undernutrition in the developing world. Second, using the LISA (a local indicator of spatial association) technique, we analyzed the geographical patterns in undernutrition to highlight the localized hotspots (regions with high undernutrition prevalence surrounded by similar other regions), cold spots (regions with low undernutrition prevalence surrounded by similar other regions).

Results:

South Asia has the highest under-five child undernutrition rates. The intra-country nutritional inequalities are highest in Burundi (stunting), Kenya (wasting), and Madagascar (underweight). The local indicator of spatial association (LISA) analysis suggests that South Asia, Middle East and North Africa (MENA) region, and Sub-Saharan Africa are undernutrition hotspots and Europe and Central Asia and Latin America, and the Caribbean are undernutrition cold spots (regions with low undernutrition surrounded by similar other regions). Getis Ord-Gi* estimates generally support LISA analysis. Moran's I and Geary's C gave similar results about the global patterns of undernutrition. Geographically weighted regressions suggest that several socioeconomic indicators significantly explain child undernutrition.

Conclusions:

We found a significant within and across country variation in stunting, wasting and underweight rates among the under-five children's population. The geospatial analysis also suggested that stunting, wasting, and underweight patterns exhibit clear regional patterns, underscoring the need for coordinated interventions at the regional level.

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURETY II
04-01-2023 12:45 - 13:45

EFFECTS OF AN EXCLUSIVE HUMAN MILK DIET IN CRITICALLY ILL TERM SURGICAL INFANTS

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America, ³University of Texas Health Science Center, San Antonio, Pediatrics/neonatology, San Antonio, United States of America

Background and Aims:

Although Human milk (HM) is considered the ideal source of nutrition for all infants, it fails to provide sufficient protein/non-protein calories in term infants with surgical conditions. Current practice is formula fortification, which carries risk for deleterious outcomes like necrotizing enterocolitis (NEC).

Methods:

Two multicenter trials were conducted in infants with single ventricle physiology (SVP) (n=107) or congenital gastrointestinal disorders (CGD) (n=151). Experimental groups were fed exclusive human milk (EHM) diets of mother's own milk (MOM), pasteurized donor human milk (PDHM) fortified with novel human milk-based fortifier (HMBF) (PBCLN-002) formulated for term infants. Control diet consisted of MOM, cow's milk fortifier and/or formula.

Results:

a) SVP			
Parameter	Control (n=52)	EHM (n=55)	p-value
Weight velocity (g/d)	16.8 (1.8, 26.5) ¹	25.4 (11.6, 42.8)	0.008
Length velocity (cm/week)	0.50 (0.32, 0.98)	0.53 (0.17, 0.82)	0.60
Head circumference (cm/week)	0.30 (0.00, 0.51)	0.24 (0.12, 0.45)	0.83

b) CGD			
Parameter	Control (n=52)	EHM (n=55)	p-value
Weight velocity (g/d)	18.8 (13.1, 23.3) ¹	21.3 (16.3, 26.8)	0.002 (0.003 adj. ²)
Length velocity (cm/week)	0.80 (0.49, 1.17)	0.82 (0.52, 1.17)	0.59 (0.19 adj.)
Head circumference (cm/week)	0.54 (0.35, 0.70)	0.54 (0.42, 0.70)	0.86 (0.57 adj.)

Necrotizing enterocolitis (NEC) rates were reduced to 1.8% and 2.0% for the EHM group as compared to 3.6% and 7.3% in control groups for SVP and CGD respectively.

Conclusions:

In neonates with high-risk surgical conditions of SVP or CGD, PBCLN-002 demonstrated increased growth velocity and a substantial decrease in the incidence of NEC. The effect on weight gain and intestinal disease may translate into beneficial long-term neurodevelopment.

O038 / #361

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURITY II
04-01-2023 12:45 - 13:45

ASSESSMENT OF BODY COMPOSITION IN PRETERM INFANTS DURING HOSPITAL

Lennart Lücke¹, Niels Rochow¹, Katja Knab², Stefan Schäfer², Jasper Zimmermann¹, Adel Szakacs-Fusch¹, Christoph Fusch¹

¹Paracelsus Medical University, Pediatrics, Nuremberg, Germany, ²Klinikum Nürnberg - Paracelsus Medizinische Universität, Pediatrics, Nürnberg, Germany

Background and Aims:

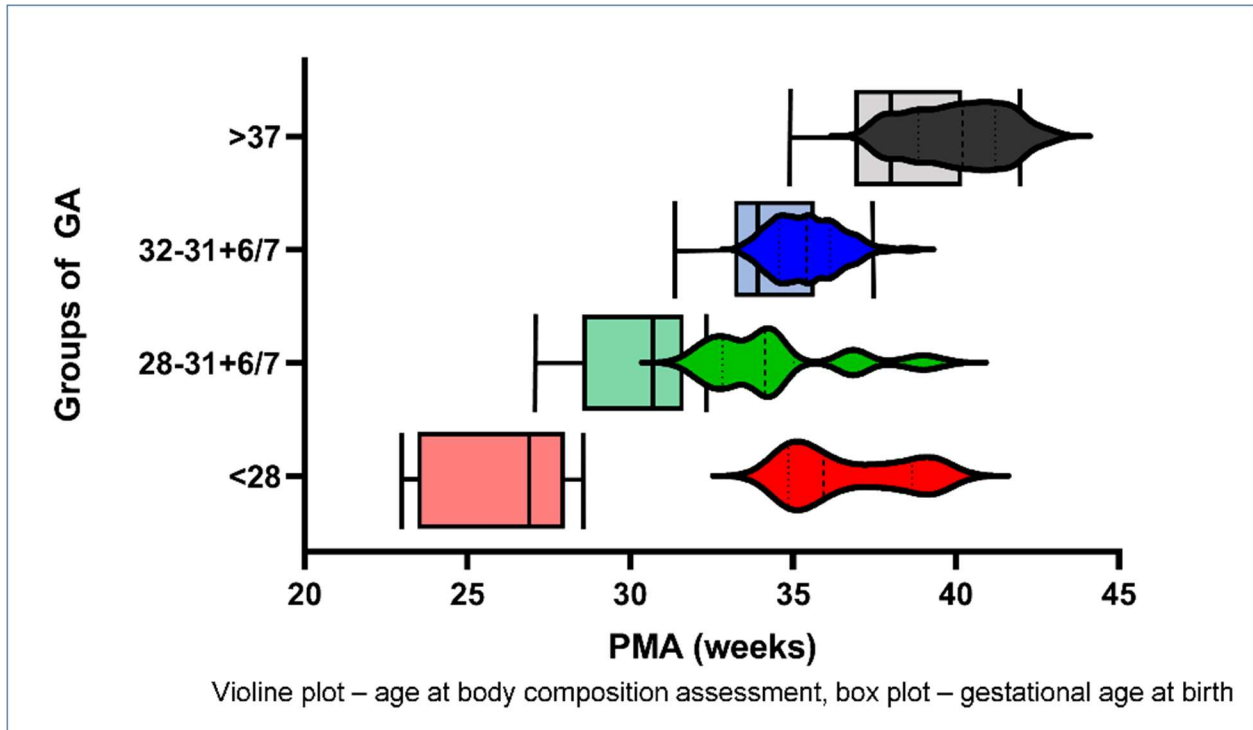
Air-displacement plethysmography(ADP) is common method to measure body composition(BC) in neonates. Bioelectric Impedance (BIA) is also available for neonates. Aim 1)to analyze the workload for weekly measurement of BCT, 2)to assess the applicability of ADP in infants in different age groups, 3)to compare BC with current reference curves, 4)to compare BC measured with BIA and ADP.

Methods:

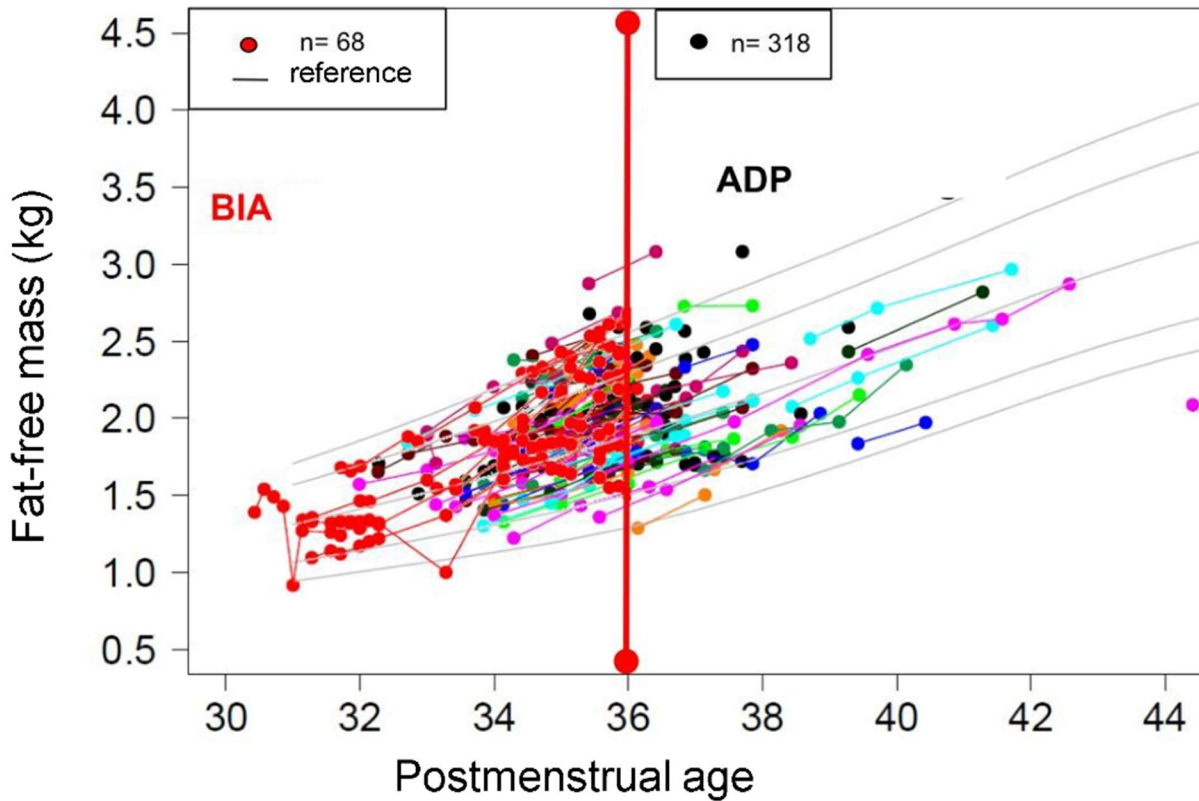
This QI project was conducted (Jan to Sept 2021) with weekly ADP(PeaPod®) of clinically stable infants without respiratory support. In a subgroup, BIA(BioScan touch i8-nano) from the first week of life were analyzed daily and weekly thereafter. Individual trajectories for fat mass(FM%), fat mass(FM), and fat-free mass(FFM)

Results:

386 tests available from 168 infants. ADP testing was at significantly later weeks of life in infants <28weeks compared with infants >32weeks(Fig.1).



Time required for ADP was 7min, 11(7-15) ADP measurements resulted in a workload of 77(49-105)min for each of two operators. BIA took 3min with one study nurse. Individual FM and FFM trajectories measured with the ADP were parallel to reference curves. The simultaneous BIA and ADP measurements showed differences (FM:14±70g, FM%:5±3%, FFM:11±70g)(Fig. 2). BIA had smaller 95%CI of FM%(10-11%) compared to ADP(11.5-13.5%).



Conclusions:

ADP and BIA have been successfully integrated into routine clinical practice with reasonable workload. The later availability of ADP during NICU stay limits narrow window for nutritional interventions. Parallel BC trajectories to reference percentiles indicate that our cohort studied had a similar growth to the reference cohort. The BIA asked potential BC measurements over the entire hospital stay. The validity of BC measurements needs further validation.

O039 / #239

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURITY II
04-01-2023 12:45 - 13:45

IMPLEMENTATION OF NUTRITIONAL CARE BUNDLE IS ASSOCIATED WITH IMPROVED GROWTH IN PRETERM INFANTS BORN BEFORE 32 GESTATIONAL WEEKS

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Background and Aims:

Preterm infants are at risk of malnutrition and growth failure, among other neonatal morbidities. This study aimed to evaluate whether implementation of a nutrition care bundle is associated with growth and morbidity in very preterm infants.

Methods:

This before-and-after study compared 87 very preterm infants (<32 gestational weeks) born 2018 (BG) with 75 infants born 2020 (AG), all treated at the same neonatal intensive care unit in the Czech Republic. A nutrition care bundle was implemented during 2019, comprising daily calculation of fluids using an online software, targeted fortification of breastmilk, and use of a standard concentrated parenteral solution. Anthropometric data was registered once weekly and perinatal data was prospectively registered for both groups.

Results:

There were no differences in baseline characteristics between the groups. During postnatal days 1-14, parenteral fluid intake was significantly lower in the AG compared to the BG and conversely, enteral fluid intake was significantly higher in the AG. Weight z-scores decreased significantly less from birth to postmenstrual age 36 weeks in the AG (-0.8 [IQR -1.3 to -0.5]) compared to the BG (-1.5 [IQR -2.0 to -1.2]) and head circumference z-scores decreased significantly less in the AG (-0.8±0.9) compared to the BG (-1.6±1.1). A decrease in the rate of treated patent ductus arteriosus was noted in the AG (P<0.001).

Conclusions:

Implementation of nutritional care bundle was associated with improved postnatal growth and may reduce treatment-requiring patent ductus arteriosus in very preterm infants.

DO SMALL FOR DATE PRETERM INFANTS HAVE ADIPOSITY IN LATER LIFE? A SYSTEMATIC REVIEW

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Background and Aims:

Historical reports suggest that infants born small for gestational age (SGA) are at increased risk for adiposity at older ages. The objective was to assess the association between SGA births and later adiposity among preterm births.

Methods:

Data Sources searched to October 2022: MEDLINE, EMBASE and CINAHL (PROSPERO CRD42020162353). Studies were included if they reported body mass index or body fat for participants born preterm with SGA or non-SGA births. All screening and extraction steps were conducted in duplicate by two reviewers. Risk of bias was assessed using the Risk of Bias In Non-randomized Studies of Interventions (ROBINS-I) tool. Data were pooled in meta-analysis using random-effects models. We explored potential sources of heterogeneity.

Results:

We found no meaningful difference in later measures of adiposity between preterm infants with and without SGA status at birth. Meta-analysis of 39 studies showed that preterm SGA birth, compared to preterm non-SGA birth, was not associated with higher BMI later in life with mean differences: -0.21 (95% CI: -0.29, 0.14, n=21,508, 31 studies, $I^2 = 23\%$), percent body fat (fat -0.02 [-0.16, -0.13], n= 797, 10 studies, $I^2 = 0\%$) or truncal fat percent -0.09 (95% CI: -0.40, 0.23, n=176, 3 studies, $I^2 = 0\%$).

Conclusions:

Evidence indicates that preterm infants born SGA are not at increased risk of developing higher adiposity or truncal fat as compared to those born non-SGA preterm infants.

O041 / #463

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURETY II
04-01-2023 12:45 - 13:45

EFFECT OF TARGETED VS STANDARD FORTIFICATION OF BREAST MILK ON GROWTH AND DEVELOPMENT OF PRETERM INFANTS (≤ 32 WEEKS): A RANDOMIZED CONTROLLED TRIAL.

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Background and Aims:

Human milk (HM) is recommended for extreme preterm infants. As breastmilk is highly variable in nutrient content, fortification of (HM) is recommended to prevent extra-uterine growth retardation. Our study evaluates the impact of targeted fortification on preterm weight gain by tailoring single macronutrients.

Methods:

This randomized controlled trial recruited preterm infants (≤ 32 weeks of gestation) within the first 7 days of life. After reaching 80 ml/kg/day of enteral feeding, patients were randomised to receive standard fortification-SF or targeted fortification- TF (standard fortification plus protein, carbohydrates, or lipids). The intervention continued until 37 weeks of post-conception age, or hospital discharge. The primary outcome measure was velocity of weight, length and head growth until 36 weeks postconceptional age or discharge. Secondary outcomes were incidence of necrotizing enterocolitis, sepsis, retinopathy of prematurity, and bronchopulmonary dysplasia.

Results:

Baseline characteristics, morbidities and total enteral nutrition did not differ (SF=21, TF=18). Eight infants required supplementation in the TF group. Macronutrient milk composition did not differ between the groups, apart from glucose, which was lower in TF. The SF had a lower macronutrient intake, but a higher weight gain (16.84 vs. 15.76, mean difference -1.08 g/kg/d 95% CI -6.39;4.24) and body weight, but this was not statistically significant. The drop-out rate was 5 vs. 7 for the TF and SF respectively.

Conclusions:

Growth was not improved by single nutrient targeted fortification. Additionally, TF turned out to be laborious, required frequent milk sampling and was inconvenient for mothers, which maybe the reason why this practice is limited to research settings.

O042 / #143

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURITY II
04-01-2023 12:45 - 13:45

ARE WE CHASING THE INEVITABLE? EFFECT OF RATIONAL NUTRITION CARE BUNDLE ON EXTRAUTERINE GROWTH RESTRICTION IN A LOW-MIDDLE INCOME COUNTRY: A BEFORE-AFTER-ANALYTICAL STUDY

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Background and Aims:

Background: Focus on preterm nutrition strategies are imperative. Extrauterine growth restriction (EUGR) is a clinically relevant, but seemingly elusive consequence that is often used to benchmark and compare outcomes. Low-middle-income countries make fastidious attempts to optimise nutrition of possibly already nutritionally-compromised fetuses

Aims: To study effect of a multipronged “Rational Nutrition care bundle”(RNCB) in very preterm infants on EUGR; in a tertiary-care unit of South-India.

Methods:

This before-after observational analytical study was designed to compare 2 groups of those <32 weeks’ gestation who completed care in the unit: Before RNCB(retrospective: BRNCB); and After RNCB(prospective:ARNCB). RNCB constituted of 3 key interventions: (a) Aggressive parenteral nutrition (PN) with high dose amino acids and lipids from day 1, (b) “rapid escalation” enteral feed regimens including earlier introduction of human milk fortifier than conventional practice (at 40 ml/kg/day feeds itself), (c) structured oromotor stimulation to promote oral feeding and colostrum mouth painting. EUGR was defined as more than -1z score difference in weight for postmenstrual age(PMA) at discharge and at

birth.

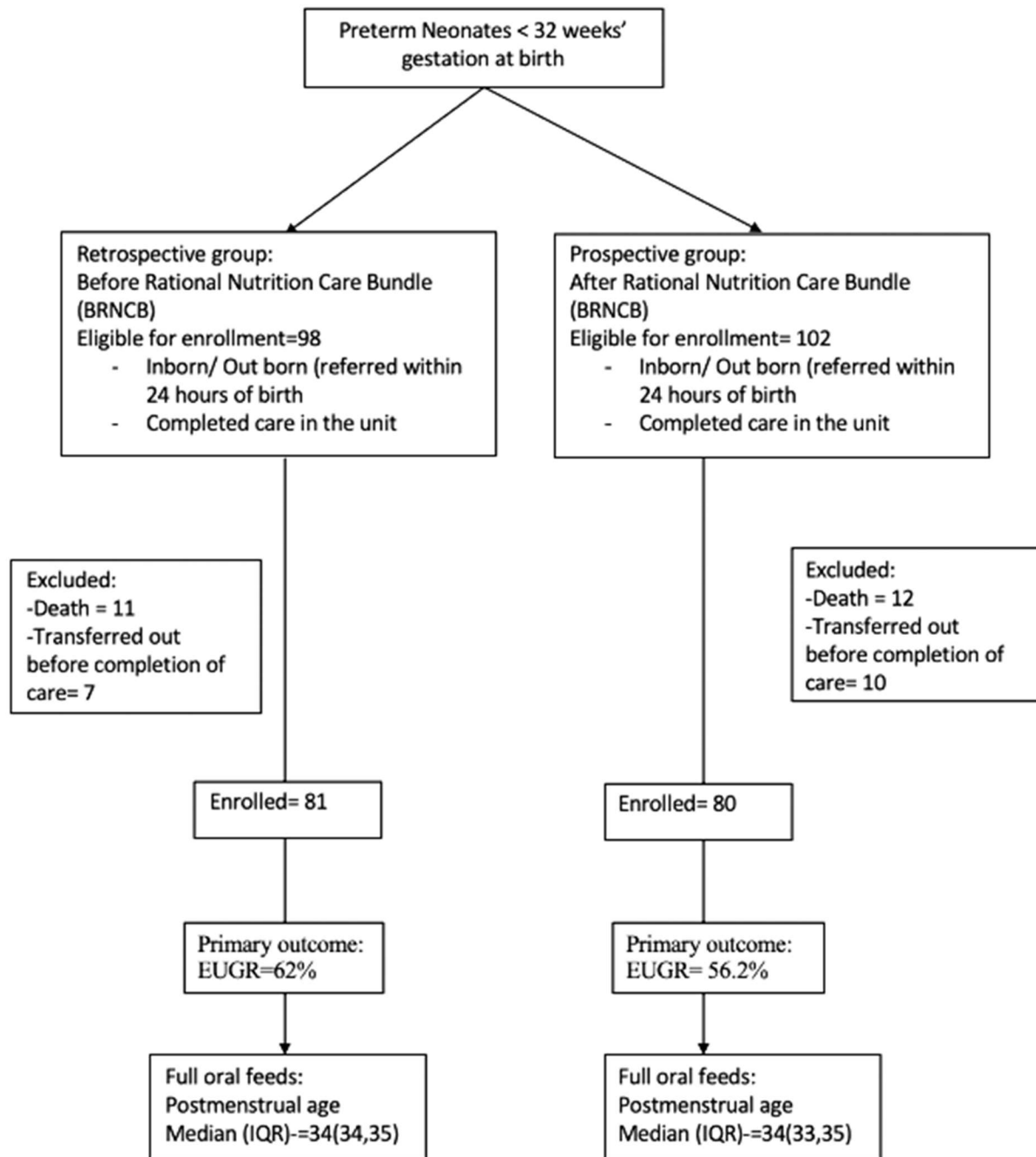


Figure 1: Study flow diagram

Results:

Data of 81 babies was retrieved for BRNCB group; 80 were included in prospective ARNCB group. EUGR proportions were not statistically significant between groups [BRNCB 62%, ARNCB 56.2%; OR 1.32 (0.67-2.6), $p=0.42$]. Full oral feeds were achieved at earlier PMA after RNCB.

Component of NCB	Before NCB N(%)	After NCB N(%)	P value
Amino acids at 3 g/kg/day from day 1	54(78)	57 (70.3)	1
*Lipid at 3 g/kg/day from day 1	-	57 (73.3)	
*Oromotor stimulation by PIOMI	-	67 (83)	
*Standard feed regimen	-	25(56.8)	
*Colostrum mouth paint	-	73 (91)	

**These interventions were part of NCB only in the prospective cohort*

Figure 2: Compliance to individual components of Nutrition care bundle (NCB)

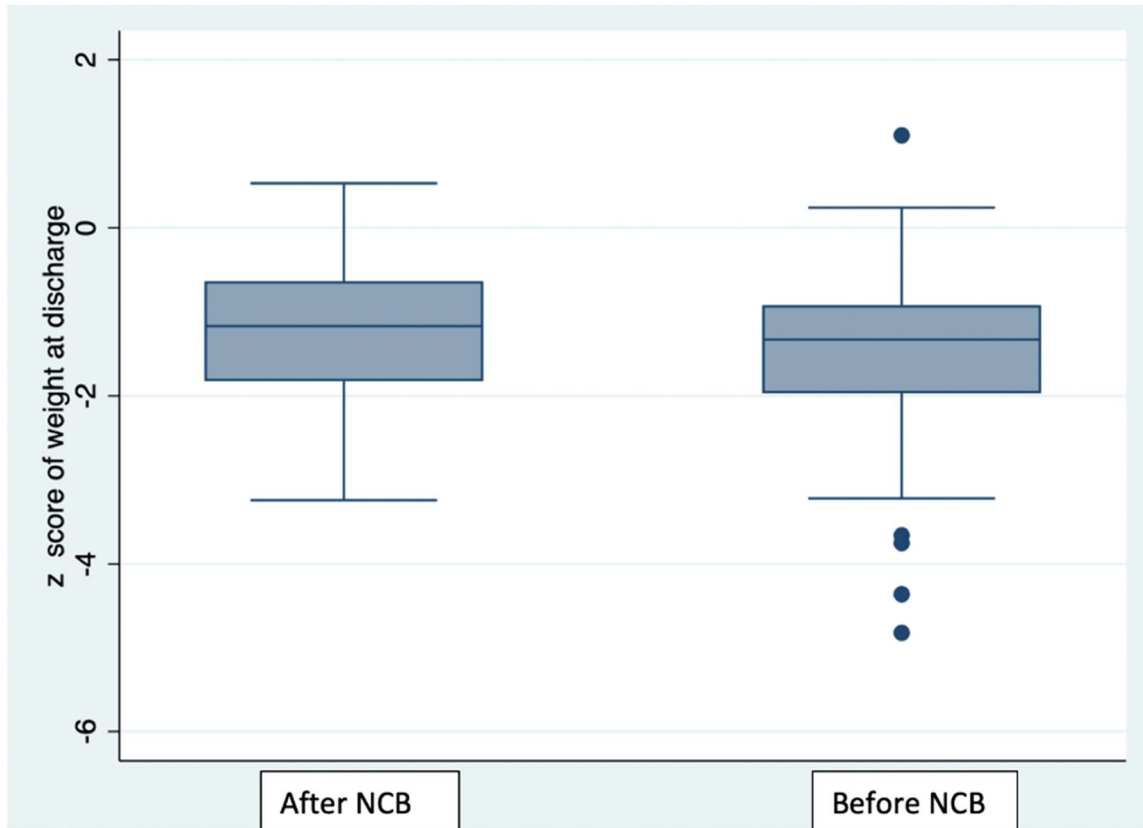


Figure 3: Box whisker plot of Z score of weight at discharge postmenstrual age

Conclusions:

EUGR rates were not reduced significantly after implementation of RNCB. Full oral-feeds were achieved earlier after RNCB implementation. RNCB including aggressive PN and early HMF is safe. Scientists may need to introspect on timing of EUGR diagnosis; other strategies to optimise body compositions.

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURITY II
04-01-2023 12:45 - 13:45

INCREASED ARGININE CONTENT IN PARENTERAL NUTRITION CORRECTS ARGININE DEFICIENCY AND REBALANCES PLASMA AMINO ACID PROFILES IN VERY PRETERM INFANTS

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Background and Aims:

Plasma amino acid (AA) profiles in parenteral nutrition (PN) dependent preterm infants (PI) consistently show overprovision of essential AA (EAA) and arginine deficiency. This may have implications for immune/inflammatory responses. PN arginine supplementation is recommended in international guidelines. Aim: To compare plasma AA profiles on d10 in PI receiving standard PN (6.3g/100gAA arginine) and a range of arginine supplemented PN (12-15;18g/100gAA).

Methods:

PI were allocated (according to intervention PN availability) in a series of 3 separate physiological (transcriptomic) studies to receive standard PN or arginine supplemented PN using identical clinical protocols. Clinical, nutritional and biochemical data were collected. Point of care testing was used to measure ammonia levels. Plasma AA levels were measured on d10 using ion exchange chromatography.

Results:

The table shows the mean (sd) data for 3 groups after combining the 3 studies. There were statistically significantly higher mean plasma arginine and lower plasma EAA levels comparing control and arginine 18g/100gAA groups. Arginine 12-15g/100gAA group data support a dose dependent relationship between arginine supplementation and plasma arginine/EAA.

	PN arginine	PN arginine	Control (n=23)	P-value*
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	18g/100gAA (n=17)	12-15g/100gAA (n=26)		
Gestation (weeks)	26.4 (1.8)	27.0 (2.3)	26.8 (2.3)	0.56
Birthweight (g)	987 (239)	888 (231)	883 (201)	0.14
Total plasma EAA (μmol/L)	966 (301)	1247 (301)	1369 (527)	0.0075
Plasma arginine (μmol/L)	100 (63)	67 (48)	42 (21)	0.0001
Blood ammonia (μmol/L)	54 (23)	57 (15)	62 (17)	0.22

*controls versus 18g/100gAA arginine

Conclusions:

PN arginine supplementation of 18g/100gAA corrects arginine deficiency and reduces overprovision of EAA in the PI plasma AA profile.

O044 / #158

ORAL PRESENTATIONS SESSION 05: NEONATAL & PREMATURITY II
04-01-2023 12:45 - 13:45

NO DIFFERENCE IN WEIGHT GAIN AMONG EXTREMELY PRETERM INFANTS IN TWO SWEDISH NEONATAL INTENSIVE CARE UNITS WITH DIFFERENT ENTERAL ENERGY INTAKES

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Background and Aims:

Practices differ between Neonatal Intensive Care Units (NICUs) in regard to the use of fortification. It is unclear if enteral energy intakes above 140 kcal/kg/day result in a higher weight gain in extremely preterm infants (EPT).

Methods:

Daily nutritional and anthropometric data were obtained from clinical records for non-small-for-gestational-age Swedish EPT infants born week 26+0 to 27+6. Included infants were treated at NICU A (n=25) or NICU B (n=39). The main outcome was change in standard deviation scores (Δ SDS) between gestational weeks 29+0 and 34+0.

Results:

The mean gestational age was 26.9 (\pm 0.438 SD) postmenstrual weeks at birth, and mean birthweight 966 (\pm 109 SD) grams. Preliminary results showed no significant baseline differences in gestational age or birthweight. Between post menstrual weeks 29+0 and 33+6, the energy intake was significantly higher at NICU B: mean (SD) 149 (\pm 14.9) vs 129 (\pm 12.0) kcal/kg/day, p =<0.001. This was driven by a higher fat intake at NICU B: mean (SD) 7.97 (\pm 1.05) vs 6.03 (\pm 0.94) grams/kg/day, p =<0.001.

There were no significant differences in Δ SDS for weight (p =0.809), length (p =0.530) or head circumference (p =0.268) between the two NICUs. Also, no significant differences in weight at postmenstrual week 34+0 was observed: 2037 grams (SD 341) at NICU A and 2022 grams (SD 214) at NICU B.

Conclusions:

Nutritional practices differ between Swedish NICUs which may be explained by differences in fortification practices and clinical traditions. Despite the considerable differences in energy and fat intake no difference in weight, length or head circumference was seen between gestational weeks 29+0 and 34+0.

O045 / #366

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

MANAGEMENT OF PAEDIATRIC FATTY LIVER DISEASE BY INTERMITTENT FASTING – A PILOT STUDY

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Background and Aims:

. Fasting f to treat fatty liver is yet to be tested in Paediatric population. We planned the following prospective pilot study incorporating fasting to

- 1) Find out the feasibility and effect of Intermittent Fasting (IF) in overweight adolescents with fatty liver
- 2) Compare it with dietary and lifestyle changes (DLS) in similar cohort

Methods:

Consecutive overweight adolescents with fatty liver, were randomised to either an intermittent fasting(IF) or a diet and lifestyle(DLS) group. . The IF Group followed home diet without strict calorie restrictions (unlike the DLS group) exercises and a 16 hours fast every day with one normal Sunday every 15 days. At 3 months all were reassessed with blood tests and ultrasound scan.

Results:

. Table 1 Baseline and post treatment parameters of nondiabetic cohort(median age 17yrs)

Treatment group	IF group		DLS group (DLS)		P Value
	N=9		N=10		
Parameters	Pretreatment	3 months after	Pretreatment	3 months after	
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	
BMI(kg/M ²)	27.9±1.2	25.5±1.2	27.8±1.8	26.9±1.8	.00026

SGPT(U/L)	94.1±17.1	58±4.8	94.4±17.1	76.3±8.2	.00716 3
SGOT(U/L)	88.9±9.2	54±4.8	91.7±8.8	78.2+ 6.3	.00002 5
Triglyceride(mg/dL)	168.9±18.7	142.2±10.6	177.6±19.7	167.2±20.6	.0007
Cholesterol(mg/dL)	182.8±19.5	162.7±13.1	186.8±15.9	167.1±7.4	.46123
Fasting Insulin (mIU/l)	29.9±5.9	24.6±5.6	29.7±8.9	28.2±8.2	0.0072
Grade of fatty liver in ultrasound	Grade 1: 8(88%) Grade 2: 1(12%)	Reduction of fatty liver by one grade : 9(100%)	Grade 2 : 3((30%) Grade1: 7((70)	Reduction of fatty liver by one grade: 5(50%)	0.0012

Conclusions:

This study is the first ever in the world to demonstrate the feasibility & superiority of intermittent fasting in adolescents with PFLD

O046 / #281

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

DXA-BASED BODY COMPOSITION REFERENCE RANGES FROM HEALTHY U.S. CHILDREN DEMONSTRATE LARGE DIFFERENCES BY RACE/ETHNIC GROUP AND MORE APPROPRIATE CHARACTERIZATION OF EXCESS ADIPOSITY COMPARED TO NHANES

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Background and Aims:

Body composition assessment aids in evaluating energy stores and determining medication doses and disease effects. Current U.S. pediatric reference ranges from NHANES include 20% of children with obesity, BMI >95th percentile. We aimed to develop DXA-based reference ranges in a geographically diverse cohort with lower obesity prevalence from the Bone Mineral Density in Childhood Study (BMDCS).

Methods:

Healthy children (height and BMI within 3rd to 97th percentiles), 5-19y, from 5 U.S. centers were measured annually for up to 7 visits. Whole body DXA scans were acquired using Hologic scanners. Precision was determined in a subsample who underwent repeat measurements. Lean soft-tissue mass index (LSTMI) and fat mass index (FMI) reference ranges were generated using the LMS method and compared to NHANES and across self-identified race/ethnicity groups.

Results:

We enrolled 2014 participants (51% female, 22% Black, 17% Hispanic, 48% White, 7% Asian/Pacific Islander, 6% with obesity) who collectively underwent 9846 DXA scans. Precision (%CV) was excellent (0.7 to 1.96%). LSTMI and FMI median (0 SD) and -2 SD curves for BMDCS and NHANES were similar, but NHANES +2 SD LSTMI and FMI curves were distinctly greater than the respective BMDCS curves. Race/ethnicity differences were more extreme for LSTMI-Z (Asian -0.47±0.98 vs Black 0.48±0.95) than for FMI-Z (Hispanic 0.29±0.98 vs Black -0.14±1.1).

Conclusions:

Because of the lower obesity prevalence in BMDCS, BMDCS body composition reference ranges may be preferred to the pediatric NHANES reference. Awareness of expected differences among race/ethnicity groups will aide in interpreting results.

Funding: NO1-HD-1-3228, NO1-HD-1-3329, NO1-HD-1-3330, NO1-HD-1-3331, NO1-HD-1-3332, NO1-HD-1-3333, R01HD100406, MO1-RR-000240, UL1RR-026314

O047 / #115

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

EFFECT OF A HIGH PROTEIN AND LOW-GLYCEMIC-INDEX DIET DURING PREGNANCY ON CHILD ADIPOSITY AT THE AGE OF 3 YEARS

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Background and Aims:

Maternal obesity before pregnancy is associated with higher offspring birthweight and obesity during childhood. The aim of this study was to investigate the effect of high vs. moderate protein intake during pregnancy on children's body weight and composition during early childhood.

Methods:

We conducted a follow-up study of children born to women (pre-pregnancy BMI 28-45 kg/m²) who were randomized to ad libitum diets during pregnancy: high-protein low-glycemic index (HPLGI) diet or medium-protein moderate-glycemic index (MPMGI) diet. Gestational weight gain (GWG) was within recommendations for women with obesity (5-9 kg) in both groups and was significantly lower for women who had followed the HPLGI diet than women who had followed the MPMGI diet (6.8±1.3kg and 8.5±1.3kg, respectively, P=0.004).

Results:

152 children were assessed at the age of 3 years (HPLGI=79, 29 girls; MPMGI=73, 31 girls). There were no statistically significant differences in anthropometric outcomes between children born to women who had followed the HPLGI diet during pregnancy compared to those who had followed the MPMGI diet: weight, mean(SE): 15.2kg(0.2) vs. 15.3kg(0.2); BMI Z-score, mean(SE): 0.60SD(0.1) vs. 0.66SD(0.1); abdominal circumference, mean(SE): 50.7cm(0.3) vs. 50.6cm(0.4); hip circumference, mean(SE): 51.8cm(0.4) vs. 52.2cm(0.4).

Conclusions:

Children born to women with pre-pregnancy overweight/obesity who manage to limit their GWG within recommendations have normal body weight and BMI Z-score at the

age of 3 years. Therefore, limiting GWG within recommendations for women with pre-pregnancy overweight/obesity by following a healthy diet independent of its protein content and glycemic index is likely a key to healthy anthropometric outcomes during early childhood.

O048 / #393

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

BODY COMPOSITION AS A NOVEL APPROACH TO EVALUATE THE RISK OF METABOLIC SYNDROME IN CHILDHOOD CANCER SURVIVORS

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Background and Aims:

Survival after childhood cancer significantly improved over the last decades, nevertheless among other possible late complications, an increased incidence of metabolic syndrome (MS) and cardiovascular (CV) disease among childhood cancer survivors (CCS) has been reported. Aim of this study was to identify body composition parameters relating with MS in CCS.

Methods:

Data of CCS at least 2 years since the end of therapies, 10-16 years old at follow-up and without any concurrent steroid treatment were collected. BMI, waist circumference (WC), WC-height ratio (WC/H), laboratory blood tests and body composition by DEXA were considered. BMI>85thp/97thp, WC>90thp and WC/H>0.5 were chosen as criteria of overweight/obesity, visceral obesity, and increased CV-risk respectively. Fat-to-Lean mass Ratio (FLR) was calculated from DEXA measurements. ROC-curve was used to test the performance of FLR in predicting metabolic and CV-risk. Nonparametric statistic was performed.

Results:

We enrolled 205 CCS (111M/94F) previously treated for a hematologic cancer (n=72), solid-tumor (n=82) or central-nervous-system tumor (n=51). FLR resulted a predictor of visceral obesity (p<0.001, AUC=0.838) and of CV-risk (p<0.001, AUC=0.815). The best FLR cut-off was 0.6. CCS with FLR>0.6 (43%) were more frequently overweight/obese (p<0.001); presented high levels of triglycerides (p=0.011), HOMA-IR (p=0.001), ALT (p=0.004), trunk-fat (p<0.001); and low IGF-1 (p<0.001) and lean mass (p=0.009).

Conclusions:

Cancer therapies may have an impact on fat and lean mass. An increased FLR is suggestive of altered body composition phenotype allowing to identify patients at risk of MS. Diet and physical activity are needed to prevent overall nutritional status derangement and maintain it over the long-term.

O049 / #172

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

**POLY- AND PERFLUOROALKYL SUBSTANCES (PFAS) EXPOSURE AT AGE 3 MONTHS
ASSOCIATE WITH GROWTH AND BODY COMPOSITION AT 2 YEARS**

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Background and Aims:

PFAS are non-degradable and accumulate in humans. PFAS-exposure in early life is thought to affect several developmental processes, mostly based on concerning results in rodent studies. Recently, we described that breastfeeding is an important PFAS-exposure determinant in early life. Exclusively breastfed infants had 6-times higher daily-PFAS-intake and 3-times higher PFAS-plasma-levels, compared to exclusively formula-fed infants at age 3 months. This is concerning, since PFAS could potentially reduce breastfeeding's health benefits. We now investigated growth and body composition outcomes at age 2 years and associations with PFAS-exposure.

Methods:

In 369 healthy term-born infants, included in birth cohort Sophia Pluto, we determined anthropometrics, visceral and subcutaneous fat by abdominal ultrasound and body composition by Dual-energy X-ray Absorptiometry(DXA) longitudinally until age 2 years. Levels of 5 individual PFAS were determined by liquid-chromatography-electrospray-ionization-tandem-mass-spectrometry(LC-ESI-MS/MS) in blood samples collected at age 3 months. We studied the associations between PFAS-levels and body composition outcome using multiple regression models.

Results:

Higher individual and total PFAS-levels at age 3 months were associated with lower weight-for-height-SDS, total fat-mass(FM) SDS, FM-index-SDS and subcutaneous fat at age 2 years. However, infants with high PFOA-levels had 3.495 higher odds (p=0.030) of accelerated rise (>0.67 SDS) in FM% during the first 6 months of life.

Conclusions:

PFAS exposure in early life is associated with body composition, but it seems not to attenuate the health benefits of breastfeeding at age 2 years. However, the association with accelerated rise in FM% during the critical window in early life could potentially lead to an unfavorable body composition in later life.

O050 / #365

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

ASSOCIATION BETWEEN GLUCOSE HOMEOSTASIS, BODY FAT MASS AND DIETARY INTAKE IN HEALTHY CHILDREN AT 6 YEARS OLD: A FOLLOW-UP FROM THE COGNIS STUDY

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Background and Aims:

Obesity is known as a causal risk factor for the development of altered glucose metabolism and insulin resistance.

Methods:

We analyzed the relationship between glucose homeostasis, body fat mass (BFM) and dietary intake in 92 children at 6 years of age who received a standard infant formula (SF,n=32), experimental formula (EF,n=32) or were breastfed (BF,n=28) during the first 18 months of life (COGNIS Study). They were classified as normal- or overweight according to body fat mass (BFM) and bioimpedance (TANITA[®]). 24-hour continuous glucose monitoring (CGM) was performed for 7 days (FreeStyle Glucose FlashMonitoring System). Glycemic variability (GV) was assessed using the multiscale sample entropy (MSE) approach and measures of entropy at various time series with R software (CGManalyzer package). 3 daily dietary records were obtained based on FAO methods and DIAL software (Alce Ingeniería, Madrid, Spain) was used to obtain macro- & micronutrients intakes.

Results:

BF children showed lower mean glucose levels compared to SF children. EF children with excess weight had higher entropy or GV compared to normal weight children. Higher omega 3 polyunsaturated fatty acids intake seems to be associated with lower BFM and skinfolds.

Conclusions:

BF protect against dysregulation of glucose homeostasis. Higher adiposity at school age and the type of diet associated with greater GV, normally linked to higher risk of developing metabolic disorders later in life.

Project funded by Ordesa Laboratories, S.L. and SMARTFOODS (CIEN Project), Spanish Centre for Technology and Industrial Development (CDTI); Contracts University of Granada General Foundation, No.3349 and 4003, Granada. Spain, and EU Project DynaHEALTH (HORIZON 2020-GA No.633595).

O051 / #283

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

PREVENTION OF OVERWEIGHT AND OBESITY IN LOW-BIRTH-WEIGHT MEXICAN PRETERM INFANTS RECEIVING MULTIDISCIPLINARY INTERVENTION FOR HEALTH SEQUELAE PREVENTION

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Background and Aims:

Overweight and obesity in early childhood constitute a burgeoning public health problem worldwide. Low-birth-weight infants are at higher risk of developing obesity and comorbidities later in life. Our objective was to investigate whether a multidisciplinary intervention including nutritional counseling could prevent the development of overweight and obesity in under-five low-birth-weight children.

Methods:

Nutritional evaluation and counseling were carried out periodically from 2 months age as part of a multidisciplinary intervention. Anthropometric measurements of 469 low-birth-weight infants were assessed at least once at 6, 36 and 60 months of age, and Growth Indicators were determined for chronological age according to the Child Growth Standards of the World Health Organization. Data were analyzed by paired samples t-test and chi-square in SPSS 25.

Results:

97% of the participants were preterm. 46.4% of the evaluated population was female, and 23.6% came from multiple pregnancies. Weight-for-age (WAZ), length-for-age (LA), head circumference-for-age (HcAZ) and BMI-for-age (BAZ) z-scores were different between sexes at 6 months. Subsequently, differences were only found in BAZ and HcAZ at 36 months. WAZ, LA, HcAZ and BAZ were different between 6 and 36 months ($p < 0.000$) and between 36 and 60 months ($p < 0.000$). The combined prevalence of overweight and obesity was 3.2% at 36 months, while 4.0% at 60 months.

Conclusions:

Early nutritional intervention and counseling in low-birth-weight infants appears to be effective in preventing overweight and obesity as the national average combined prevalence of overweight and obesity is calculated in 8.4%.

ORAL PRESENTATIONS SESSION 06: OBESITY II
04-01-2023 12:45 - 13:45

INFLUENCE OF MOTHERS' OBESITY-RELATED GENE POLYMORPHISMS ON NEWBORNS' BIRTHWEIGHT: A NUTRIGENETIC TRIAL

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Background and Aims:

Obesity-related gene polymorphisms may be risk factors for adverse outcomes in high-risk pregnancies, influencing the newborns' nutritional status. We investigated if the mothers' polymorphisms in FTO (rs9939609T/A, rs17817449T/G) and ADRB2 (rs1042713G/A, rs1042714C/G) genes influenced the birthweight of the newborns.

Methods:

We conducted a nutrigenetic trial in a public hospital at Rio de Janeiro/Brazil (2016-2020), which is reference for high-risk pregnancies. Pregnant women with pregestational diabetes mellitus (types 1 or 2) receiving nutritional assistance were included (n=70). The DNA was extracted from saliva samples and genotyped using real-time PCR. We compared the adequacy of birthweight for sex and gestational age according to the Intergrowth-21th Standards and the prevalence of macrosomia (birthweight 4000 g or above) between mother's genotypes, using Chi-square tests.

Results:

The sample had 66 live newborns, 52.2% males, 90.9% delivered by C-section, at 38.0 weeks of pregnancy (SD 1.3), birthweight 3322.3 g (SD 714.9) for males and 3360.9 g (SD 628.3) for females. The prevalence of macrosomia was 16.7% and 36.4% of large-for-gestational age (LGA). The newborns from mothers A allele carriers for FTO rs9939609 had lower LGA prevalence than TT genotypes (25.0% vs. 53.8%, p= 0.02). All women with GG genotype for ADRB2 rs1042714 had LGA newborns, with significant difference comparing to the C allele carriers (p=0.04). We found no statistical difference for macrosomia prevalence.

Conclusions:

The mothers' genotypes for FTO rs9939609 and ADRB2 rs1042714 influenced the prevalence of LGA newborns. The nutrigenetics approach deserves deeper investigation to improve the antenatal care in high-risk pregnancies. Funding acknowledgements: CNPQ, CAPES, and FAPERJ.

O053 / #122

ORAL PRESENTATIONS SESSION 07: INFANCY
04-01-2023 12:45 - 13:45

MACRONUTRIENT DISTRIBUTION IN BREASTFED AND FORMULA FED PRETERM INFANTS DURING THE FIRST YEAR OF LIFE: A SUBGROUP ANALYSIS OF A PROSPECTIVE, RANDOMIZED TRIAL

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Background and Aims:

Macronutrient distribution changes during complementary feeding (CF) and is indicated to impact growth and health outcomes. This study investigates macronutrient distribution between breastfed and formula fed very low birth weight (VLBW) infants during the period of weaning.

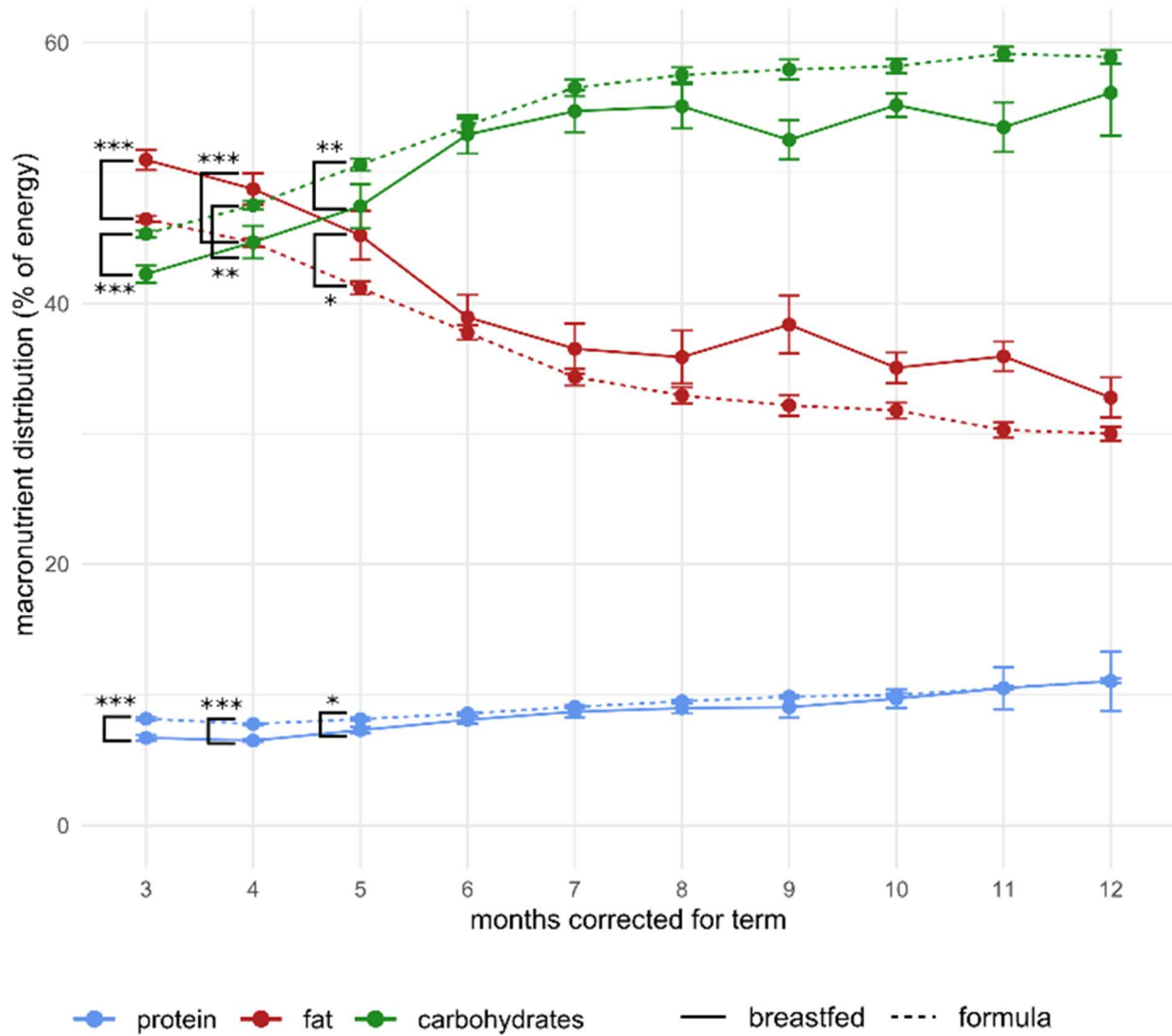
Methods:

This study is a subgroup analysis of a randomized intervention trial in VLBW infants. In addition to formula or breastfeeding infants were fed a standardized CF concept. Depending on the type of feeding infants were assigned to either a breastmilk or formula group. Nutritional intake was assessed using self-reported monthly 3-day dietary records from 3-12 months (M3-M12) of corrected age. Group differences were calculated using a linear-mixed effects model accounting for possible correlations between siblings of multiple births.

Results:

Among all infants who underwent randomization (177), dietary record analysis was done in 120 infants. In M3 16% of infants were breastfed decreasing to only 3% in M12. Although, there was no significant difference in energy intake (kcal) between the groups, macronutrient distribution (% of energy) significantly differed until M5. Proportional intakes of protein and carbohydrates were significantly higher in formula fed infants whereas proportional fat intake was significantly higher in breastfed infants. (Figure 1) Formula fed infants did not meet fat intake recommendations (0-3 months: 45-50%, 4-12 months: 35-45%) from 7 to 12 months of corrected age.

Figure 1: Macronutrient distribution in breastfed and formula fed infants. Presented as estimated marginal mean and standard error of the linear mixed-effects models. No p-values were calculated at M9-M12 as the number of breastfed infants was low. P values <.05 were considered statistically significant. Parameters with significant differences were marked with * p<.05; ** p<.01; *** p<.001.



Conclusions:

These results indicate that there is a gap in macronutrient intake between breastfed and formula fed VLBW infants during the period of CF, hence, possibly playing a critical role in growth regulation in VLBW infants.

O054 / #198

ORAL PRESENTATIONS SESSION 07: INFANCY
04-01-2023 12:45 - 13:45

EARLY LIFE GUT MICROBIOME DEVELOPMENT IN BANGLADESHI INFANTS, ITS ASSOCIATION WITH FOOD INTAKE AND HEALTH OUTCOMES

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Background and Aims:

We characterized infants' gut microbiome maturation as a trajectory in the Microbiota and Health Study (MH), Bangladesh (NCT02361164). For bacteria in trajectory, we examined their associations with diet, metabolites, and health.

Methods:

Reference set was MH infants with vaginal delivery, absence of diarrhea episodes until 24 months, weight-for-length Z-scores > -2 at all visits (n=37/222). Using metagenomics data from fecal samples (birth, 2, 6, 10, 15, 18 and 24 months), modeling of microbiome-age was performed to capture age-appropriate maturation. Fecal metabolites were measured using a mass spectrometry platform. Consumption of 13 food items was recorded every month qualitatively. A market basket algorithm was applied at different age-groups to identify feeding-patterns associated with microbiome maturation.

Results:

In gut microbiome maturation reference trajectory, bacteria known to produce Short-Chain Fatty-Acids (SCFAs) were *Bifidobacterium longum* (acetate), *Blautia obeum* and *Veillonella parvula* (propionate), *Eubacterium rectale*, *Faecalibacterium prausnitzii* and *Anaerostipes hadrus* (butyrate). Fecal propionate significantly increased with age (p-value = 2.4×10^{-41}). Suji intake was associated with higher butyrate, and milk consumption with lower butyrate (both p-values < 0.05) at multiple timepoints. *Blautia obeum* abundance was significantly higher in 0 vs. 3+ diarrhea episodes (cumulative incidence from 10 to 24 months) by a longitudinal, permutation-based test (p-value < 0.05). *Blautia obeum* was positively associated with egg consumption at 15 months (p-value = 0.04).

Conclusions:

SCFAs-producing bacteria, amongst others, constituted the reference microbiome trajectory characterizing the infants' age-appropriate gut microbiome maturation and its link to diet and health.

O055 / #114

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

FISH IMPROVED HEAD CIRCUMFERENCE AND MID-UPPER ARM CIRCUMFERENCE AMONG INFANTS AGED 6 - 7 MONTHS IN A RANDOMISED CONTROLLED TRIAL

Given Chipili¹, Averalda Van Graan², Carl Junior Lombard³, Evette Van Nierkerk⁴

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Background and Aims:

Fish is a good source of protein. It can be utilised by low income families with limited access to other animal source proteins to improve the nutrition status of children below the age of five. The main objective of the study was to assess the effect of fish given during the complementary feeding on improved head circumference (HC) and Mid-upper circumference (MUAC) among infants aged 6 -7 months.

Methods:

A randomised controlled trial was conducted from April 2019 to January 2020 in Samfya district, Luapula Province Zambia. Infants (238) were randomised to either the fish group (intervention) or the sorghum group (control). The infants were given fish powder and sorghum powder respectively for a period of 6 months and they were followed weekly for product distribution (Fish and sorghum powder) and to monitor compliance. Head circumference measurements were conducted at baseline and once each follow-up month for a period of six months while MUAC measurements were conducted twice (at baseline and endline).

Results:

A Linear mixed effects model using STATA (version 16), showed that fish improved head circumference for age z score (HCZ) by 0.53 (95% CI: 0.23-0.82), p-value <0.001 and MUAC by 0.36 (95% CI: 0.13-0.59) p-value <0.002. Fish had an effect on HC and MUAC.

Conclusions:

Therefore, fish can be used as a main protein for infants and young child feeding in low-income countries and regions with limited access to meat.

O056 / #488

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

EUROPEAN PRACTICES IN USE OF ARTIFICIAL/NASOGASTRIC TUBE FEEDING IN WEANING INFANTS WITH SHORT BOWEL SYNDROME ASSOCIATED INTESTINAL FAILURE (SBS-IF) ONTO ORAL/ENTERAL NUTRITION: AN ERNICA SURVEY

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Background and Aims: There is little evidence on how to introduce enteral nutrition(EN) to clinically stable infants with neonatal onset short-bowel-syndrome(SBS) associated intestinal failure(IF), SBS-IF. Our aim was to gain details on nasogastric(NG) feed use in intestinal rehabilitation centres.

Methods: Fifty ERNICA* centres were questioned about NG feed use in infants with SBS-IF>27 days and able to suck and swallow relating to: 1. Early weaning <6 months old and 2. infants >6 months.

Results: 34 centres in 15 countries responded. Twenty, 59% rarely (18) or never (2) used NG feed whereas 14, 41% used it when infants could feed orally. Twenty-five, 73%, gave supplemental NG feed in infants taking insufficient feed to wean off PN and 9, 27% did not. Fourteen, 41% gave NG feeds for minimum time possible and 18, 53% continued throughout PN weaning. In infants >6 months NG feeding was bolus + continuous in 15, 44% centres, according to clinical situation(2), daytime boluses + continuous overnight(13) or in 10, 29% bolus alone, and in 6, 17% intermittent infusion. Commercial formula feed was preferred in 15, 44% centres with 15, 44% favouring hydrolysed protein. Thirteen centres, 38% gave NG feed supplement when infants >6 months were taking insufficient orally to wean PN.

Conclusions: Artificial gastric tube feeding was widely given to SBS-IF infants weaning PN with about half centres minimising use and half continuing whilst reducing PN volume. Studies are needed to understand best practice. * European Reference Network for rare inherited and congenital (digestive and gastrointestinal) anomalies

O057 / #149

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

EXPOSURE TO THE CHINESE FAMINE OF 1959-1961 AT DIFFERENT LIFE STAGES AND RISK OF LATER-LIFE NON-COMMUNICABLE DISEASES: A RETROSPECTIVE COHORT STUDY FROM A LIFECOURSE PERSPECTIVE

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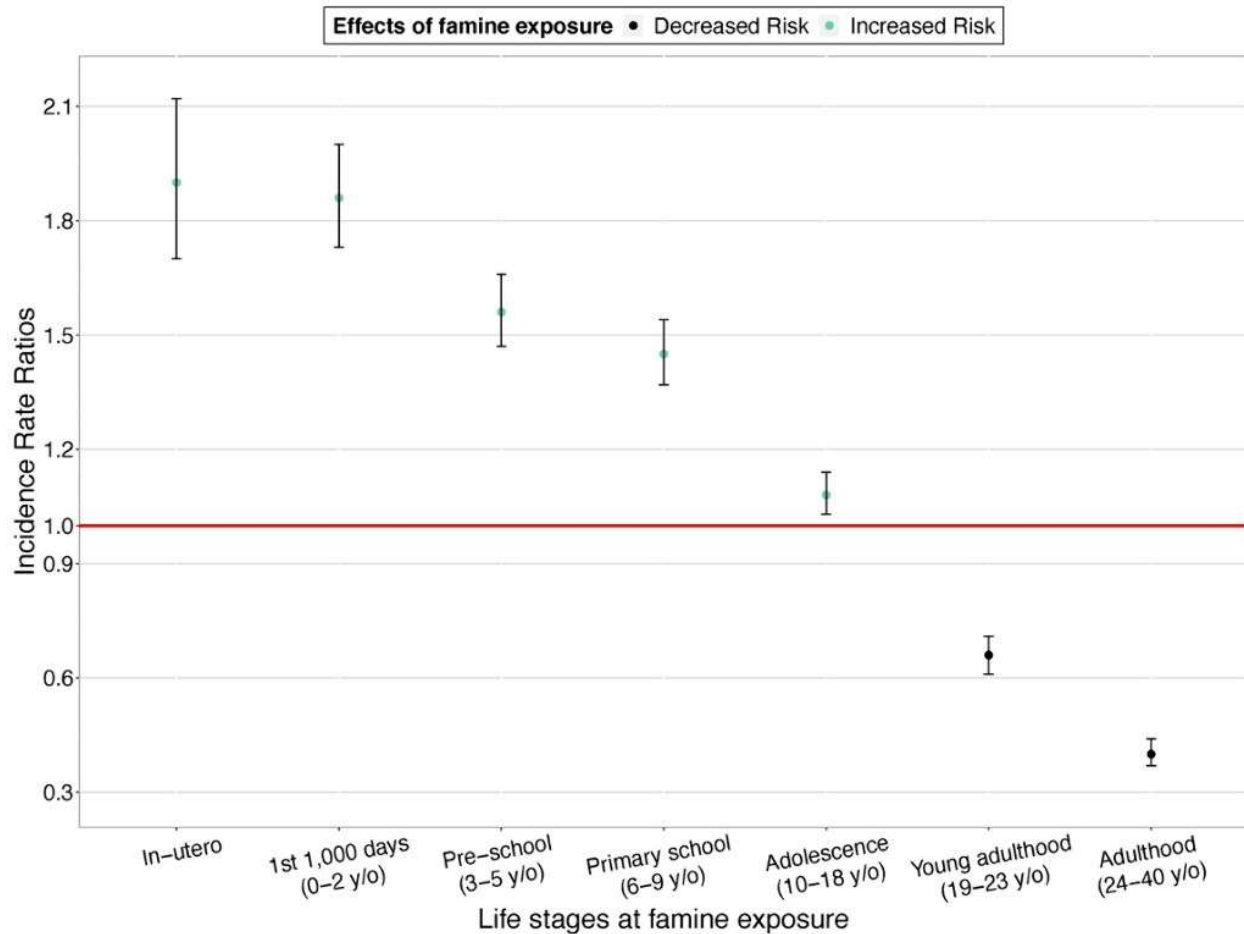
Background and Aims:

Current crises like the COVID-19 pandemic and conflict exacerbate the double burden of childhood undernutrition and overweight/obesity linked to later-life NCDs that many countries face. However, the timing and nature of this link is not well understood. We take a lifecourse perspective to investigate whether later-life NCD-effects of the Chinese famine of 1959-1961 depend on: the life stage when people were exposed; severity of famine exposure; and gender differences.

Methods:

We used data from China Health and Retirement Longitudinal Study (2011-2018, n=11,094). We measured famine exposure using self-reported experiences, we measured life stages using age at famine exposure, and we measured NCDs using multimorbidity. We performed Poisson growth curve models.

Results:



First, compared with people unexposed to famine, people exposed before age 18 had higher risk of later-life multimorbidity, particularly if exposed in-utero (IRR = 1.90, 95% CI [1.70, 2.12], $p < .001$) and in the 1st 1,000 days of life (IRR = 1.86, 95% CI [1.73, 2.00], $p < .001$; 0-6 months group: IRR = 1.95, 95% CI [1.67, 2.29], $p < .001$). Second, the famine effects did not differ between people moderately and severely exposed. Third, the famine effects did not differ between women and men.

Conclusions:

In an individual's life course, in-utero and the 1st 1,000 days is a critical time window of development and growth with marked long-term NCD implications if famine/malnutrition are experienced at this time. However, this window remains open till young adulthood. This highlights the need to invest more in nutrition to tackle the challenges of later-life NCDs.

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

INFANT AND TODDLER FORMULAS SUPPLEMENTED WITH 5 HMOS AND FED FROM BIRTH TO 15 MONTHS MODULATE THE GUT MICROBIOME TRAJECTORY TOWARDS THAT OF BREASTFED INFANTS

Shailay Kumar Dogra¹, Paula Rodríguez-García², Josef Korbinian Vogt², Janne Marie Moll², Viktor Bauer³, Malgorzata Arciszewska⁴, Maria Tarneva⁵, Svilen Dosev⁶, Sirma Dimitrova⁷, Olga Nikolova⁸, Marzena Nowak⁹, Magdalena Szuflińska-Sidorowicz¹⁰, Bartosz Korczowski¹¹, Rositsa Karcheva-Beloeva¹², Stefan Banov¹³, Bogusława Cimoszko¹⁴, Wiesław Olechowski¹⁵, Istvan Tokodi¹⁶, Robert Simko¹⁷, Aleksander Krasnow¹⁸, Zsuzsanna Tengelyi¹⁹, Piotr Korbal²⁰, Marta Zolnowska²¹, Anton Bilev²², Georgios Vasilopoulos²³, Sylwia Korzynska²⁴, Miroslava Bosheva²⁵, István Laki²⁶, Margarita Koleva-Syarova²⁷, Toni Grigorov²⁸, Steliyana Kraeva²⁹, Éva Kovács³⁰, Rada Markova³¹, Grazyna Jasieniak-Pinis³², Katalin Fister³³, Sebastien Paoli³⁴, Bernard Berger³⁵, Norbert Sprenger¹, Colin I. Cercamondi³⁶, Nicholas P Hays³⁷, Tatyana Stoeva³⁸

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Background and Aims:

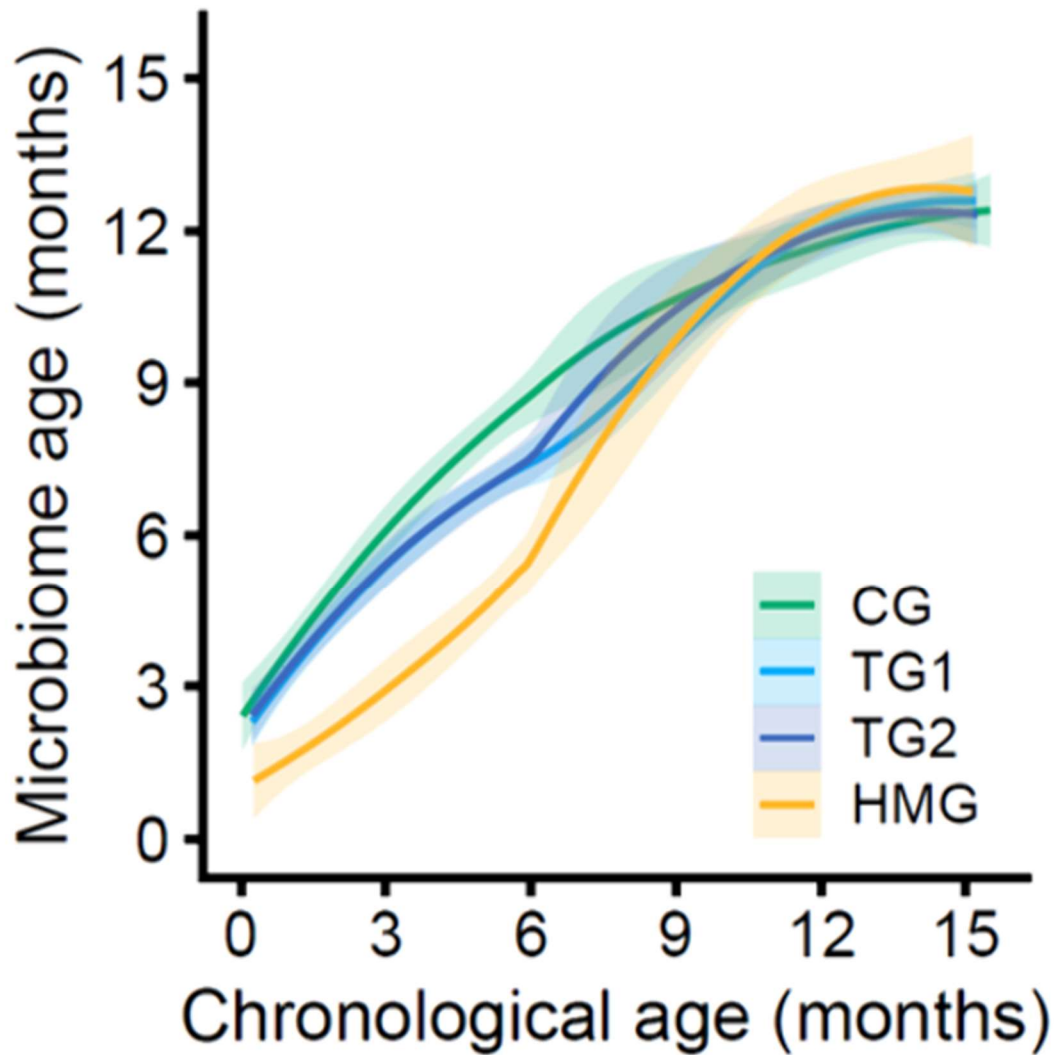
Human milk oligosaccharides (HMOs) are known to drive gut microbiome development during early life. We assessed microbiome related secondary-endpoints in a randomized controlled trial of infants fed formulas containing a blend of five HMOs.

Methods:

Formula-fed infants (7-21d at enrollment) were randomized to control (CG, n=154), standard cow's milk-based infant formula [IF] until age 6 months (m), follow-up formula [FUF] until 12m, growing-up milk [GUM] until 15m or the same formula regimen supplemented with either lower (TG1, 1.5g/L, n=155) or higher (TG2, 2.5g/L, n=153) HMO concentration in IF, followed by identical FUF (0.5g/L) and GUM (0.4g/L) for both TG1 and TG2. Fecal samples (baseline, 3, 6, 12, 15m) were used for microbiome profiling. Microbiome-age predictor training using Genus, Species, or CAZyme composition was conducted with reference data from non-randomized vaginally delivered breastfed infants that were enrolled in parallel (HMG-VD, n=31). Models were applied to CG, TG1, and TG2 to predict microbiome-age and identify outliers (microbiome-for-age z-score: $|MAZ| > 3$). Microbiome-age trajectories were compared for each group against the HMG-VD reference trajectory.

Results:

Using Genus-based model (10 features, $R^2=0.862$), TG trajectories converged on reference trajectory earlier than CG, i.e., significantly distinct until ~11.4 months (CG), ~9.4 months (TG1), ~9.6 months (TG2). Following intervention, outliers were significantly reduced in TGs compared to CG (overall trend test $p=0.0002$) and at visits (3-6m $p=0.0002$; 12-15m: $p=0.0377$). Trends on other data models were similar.



LOESS fit microbiome-age trajectories for each feeding group using an age predictor trained on HMG-VD using genus-level data (10 features, optimized with RMSE, $R^2=0.862$). Shaded areas indicate 95% confidence intervals. Note: HMG trajectories contain only vaginally delivered infants, while others have all delivery modes. CG, TG1, and TG2 were no longer statistically different from the HMG-VD trajectory at ~ 11.73 , ~ 9.37 , and ~ 9.63 m, respectively, indicating that convergence was reached.

Conclusions:

IF, FUF, and GUM supplemented with specific blend of five HMOs modifies the infant gut microbiome maturation trajectory towards that of breastfed, vaginally-delivered reference infants.

O059 / #265

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

EVALUATION OF RISK FACTORS RELATED INTESTINAL MICROBIOTA COMPOSITION IN CHILDREN WITH COW MILK ALLERGY (MICROBALANCE STUDY)

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Background and Aims:

The development of the infant's microbiome during the first 1000 days of life is dependent on a range of factors. In this study, we planned to evaluate the presence of previously identified risk factors for dysbiosis in children with cow's milk allergy (CMA) and to compare with healthy children.

Methods:

This study used a cross-sectional electronic survey with a national convenience sample of 270 children with CMA according to their caregivers and 2154 healthy controls in Turkey.

Results:

Maternal body weight at conception ($p < 0.01$) and at delivery ($p < 0.001$), weight gain during pregnancy ($p < 0.01$) were significantly higher in children with CMA. Antibiotic use at birth or during the first week of life were also higher in children with CMA (41.9% vs. 27.4%; $p < 0.01$). There was no difference in maternal age, infants gender, delivery mode, breastfeeding during the first 24 hours of life, presence of pets at home. When we combined three risk factors (C-section delivery and antibiotic use during or first 7 days of life and no breastfeeding in first hour life), the presence of these risk factors are common in CMA group (74/270; 27.4%) comparing the healthy controls (412/2154; 19.1%) ($p < 0.001$).

Conclusions:

Maternal overweight and antibiotic use during early life, and combination of three risk factors (C-section delivery and antibiotic use during or first 7 days of life and no breastfeeding in first hour life) are associated with an increased risk of CMA, and are also known to be associated with gastro-intestinal microbiota composition.

ORAL PRESENTATIONS SESSION 07: INFANCY
04-01-2023 12:45 - 13:45

THE RELATIONSHIP OF FEEDING MODE, YOGHURT AND FRUIT INTAKE WITH THE INFANT GUT MICROBIOME COMPOSITION

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Background and Aims:

In early life, the gut microbiome and nutrition of an infant are highly dynamic and essential for (metabolic) health and the development/maturation of the immune system. We explored the relationship of infant diet to the composition and development of the gut microbiome from birth to 1 year of age in the Dutch birth cohort, Lifelines-NEXT.

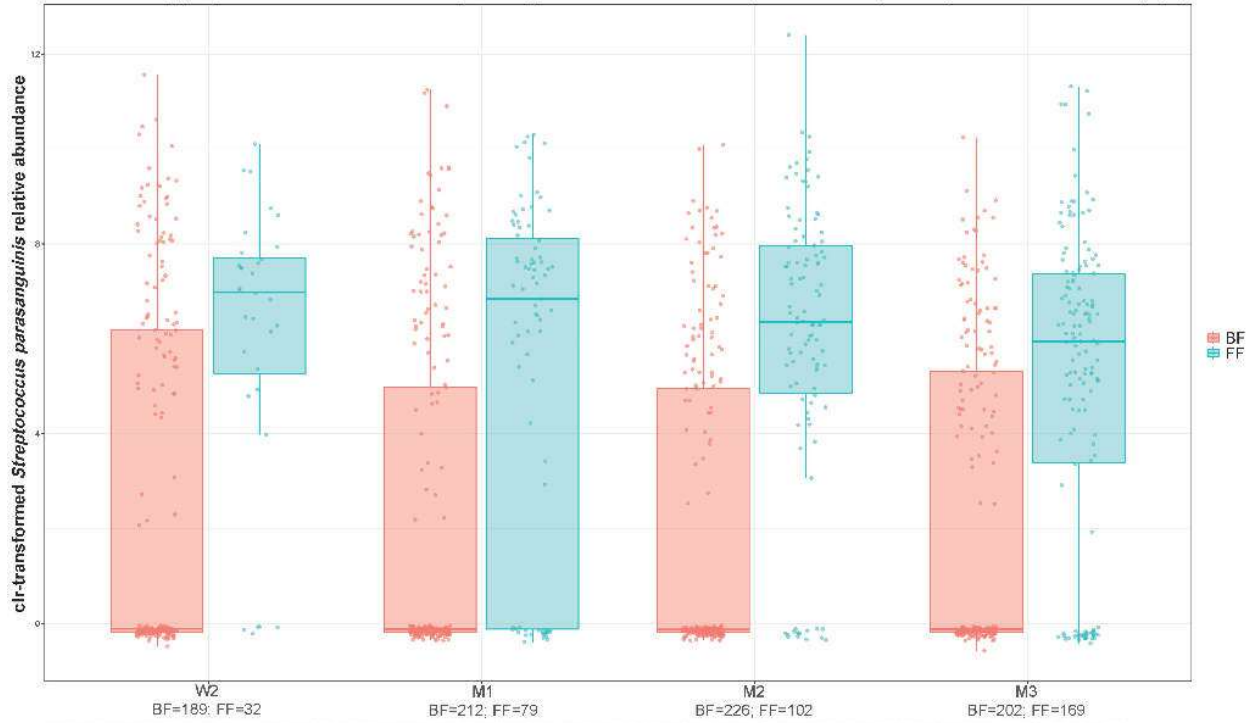
Methods:

We collected 2,962 stool samples and dietary information from 714 infants at 7 time points during the first year of life, and used multivariable generalized additive models, adjusted for technical covariates and energy intake.

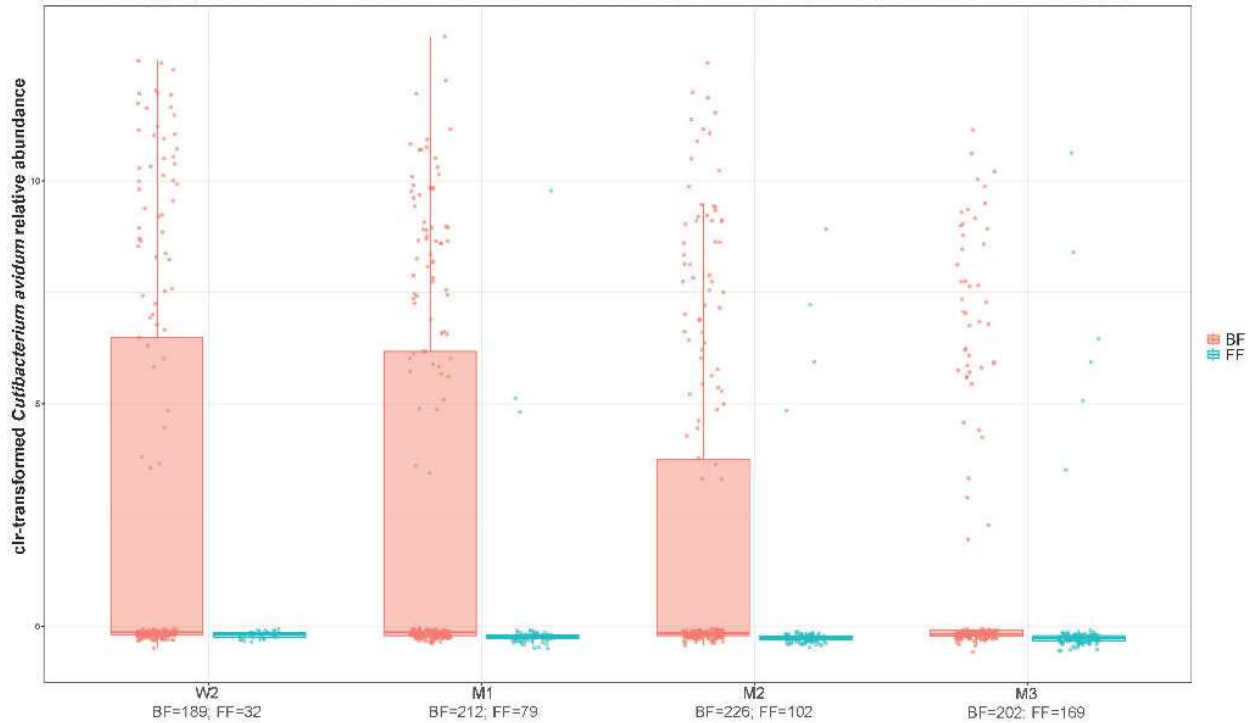
Results:

We found that formula feeding (FF) was positively associated with commensals of the oral cavity (e.g. *Streptococcus parasanguinis*) in the infant gut microbiome from 0.5-3 months of age (FDR<0.05; Figure 1), while breastfeeding (BF) was positively associated with both skin (e.g., *Cutibacterium avidum*; Figure 2) and oral bacteria (e.g. *Haemophilus parainfluenzae*; Figure 3).

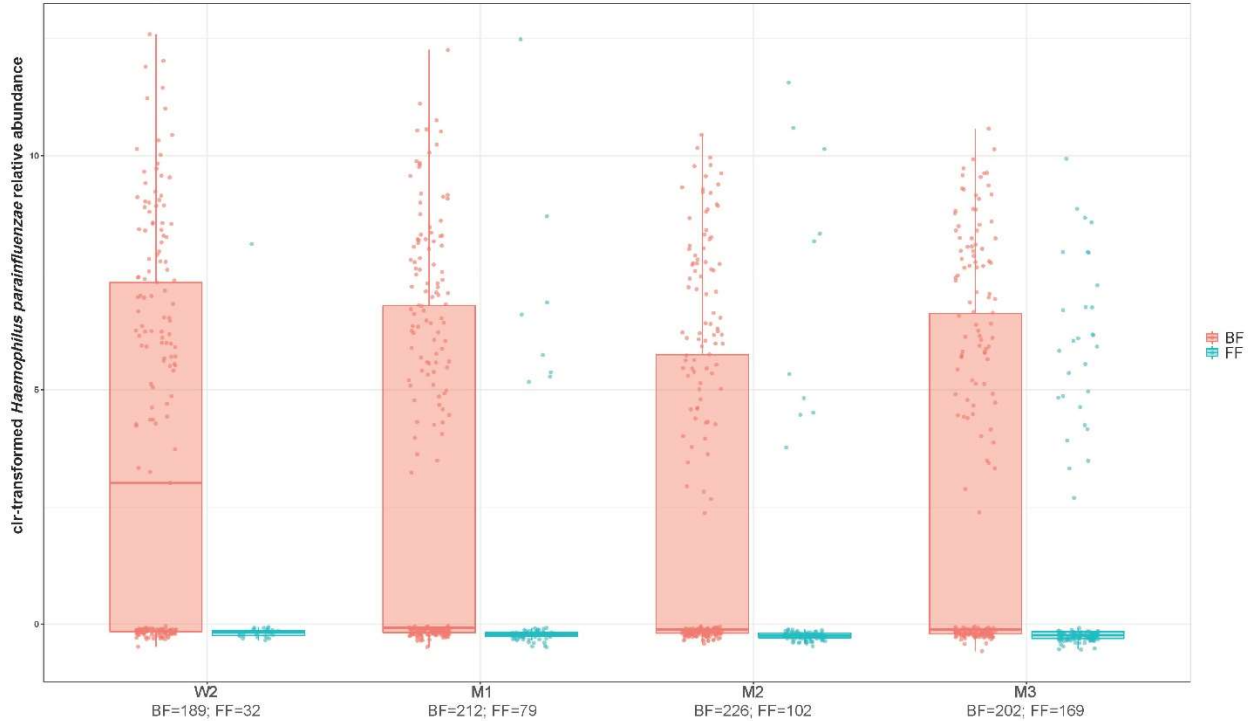
Formula feeding (FF) associated with increased *S. parasanguinis* relative abundance (clr-transformed) in comparison to breastfeeding (BF)



Breastfeeding (BF) associated with increased *C. avidum* relative abundance (clr-transformed) in comparison to formula feeding (FF)

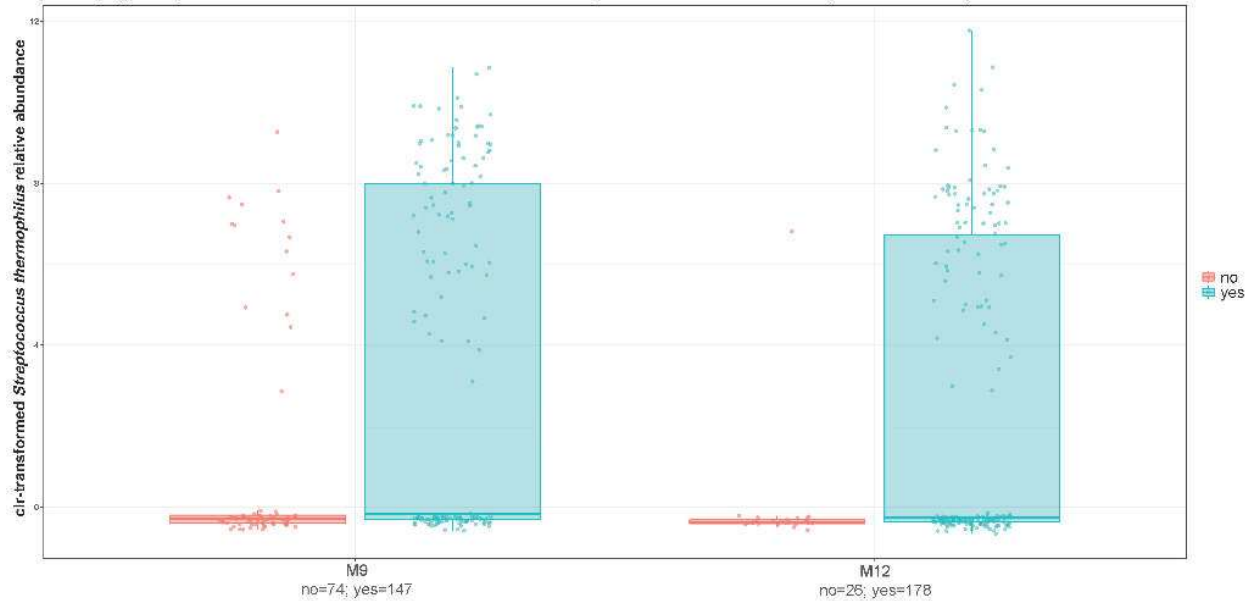


Breastfeeding (BF) associated with increased *H. parainfluenzae* relative abundance (clr-transformed) in comparison to formula feeding (FF)



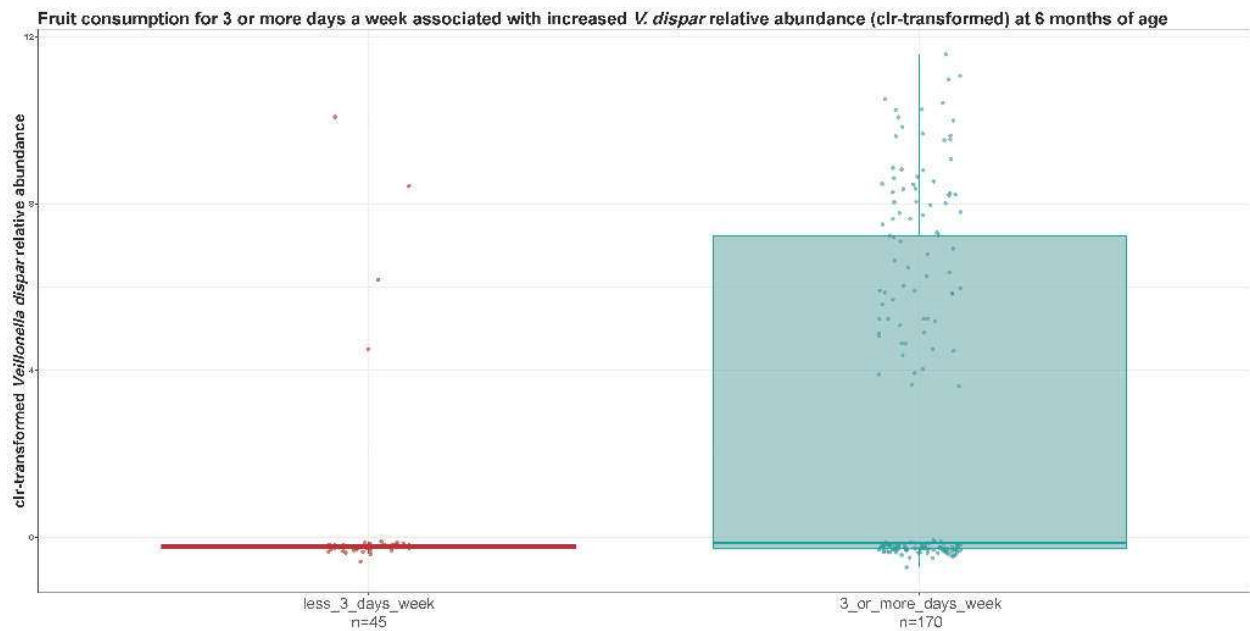
Following the introduction of complementary/solid food, *Streptococcus thermophilus*, (commonly used in fermented dairy products), was positively associated with infant yoghurt/quark intake at 9 and 12 months of age (Figure 4).

Infant yoghurt/quark intake associated with increased *S. thermophilus* relative abundance (clr-transformed)



Lastly, the consumption of at least 3 portions of fruit a week was positively associated with *Veillonella dispar* (Figure 5) at 6 months of age. This *Veillonella* species was

found to be positively associated with higher insulin sensitivity and lower inflammation levels in adult gut microbiome dietary studies.



Conclusions:

In conclusion, in a large longitudinal metagenomic study, we identified associations of feeding mode, yoghurt and fruit intake with the infant gut microbiome composition.

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

INFANT AND TODDLER FORMULAS SUPPLEMENTED WITH 5 HMOS AND FED FROM BIRTH TO 15 MONTHS ARE SAFE AND SUPPORT AGE-APPROPRIATE GROWTH: A RANDOMIZED, CONTROLLED TRIAL

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Background and Aims:

Human milk oligosaccharides (HMOs) are important for healthy infant development. We assessed growth, safety, and gastrointestinal (GI) tolerance in infants fed formulas containing a blend of five HMOs (2'-fucosyllactose, 2',3-di-fucosyllactose, lacto-N-tetraose, 3'-sialyllactose, and 6'-sialyllactose).

Methods:

In a multicenter study in Europe, formula-fed infants (FFI; 7-21 d at enrollment) were randomized to control (CG, n=233, standard cow's milk-based infant formula [IF] until age 6mo, follow-up formula [FUF] until 12mo, growing-up milk [GUM] until 15mo) or the same formula regimen supplemented with either lower (TG1, 1.5g/L, n=230) or higher (TG2, 2.5g/L, n=230) HMOs in IF, followed by identical FUF (0.5g/L) and GUM (0.4g/L) for both TG1 and TG2. Non-randomized breastfed infants (BF, n=96) were included as a reference group. Anthropometry, stooling pattern, GI tolerance, and adverse events (AEs) were assessed through 15mo.

Results:

Mean anthropometric z-scores were similar among FFI and tracked closely with WHO standards through 15mo (largely within ± 1.0 SD). Soft stooling pattern was observed in FFI with no differences in stool consistency between FFI and BF after 4mo. Parent-reported GI symptoms (spit-up/gassiness) and associated behaviors (crying/fussiness/sleep) were generally comparable between FFI and BF. A validated GI symptom index was < 19 in FFI through 15mo and largely comparable with BF, indicating sustained good GI tolerance. Parent-reported and physician-confirmed AEs were similar among FFI.

Conclusions:

IF, FUF and GUM with a specific blend of five HMOs support adequate growth and are safe and well-tolerated through age 15mo.

ORAL PRESENTATIONS SESSION 07: INFANCY

04-01-2023 12:45 - 13:45

MATERNAL INFLAMMATION AND METABOLIC MARKERS DURING PREGNANCY AND ASSOCIATIONS WITH BIRTH-RELATED AND BREASTFEEDING OUTCOMES

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Background and Aims: Gestational inflammation is suggested to reduce birthweight and duration of breastfeeding. Furthermore, appetite-regulating hormones in maternal plasma and human milk (HM) might affect breastfeeding including HM composition, but evidence is sparse. We aim to investigate if biomarkers of inflammation and metabolism in pregnancy are associated with birth-related and breastfeeding outcomes.

Methods: Seventy-one mother-infant dyads participating in the Mothers, Infants and Lactation Quality study in Copenhagen were included. Fasting blood samples were collected around the 28th gestational week and HM samples and 24-hour milk intake at three times between 1.0-8.49 months postpartum. Inflammation and metabolic markers included hs-CRP, TNF- α , IFN- γ , IL-6, IL-8, HDL, LDL, VLDL, total-cholesterol, triglycerides, leptin, adiponectin, insulin, c-peptide, HOMA-IR and glucose following an oral glucose tolerance test.

Results: Maternal pre-pregnancy BMI was positively associated with gestational hs-CRP, log-TNF α , c-peptide, leptin, insulin and HOMA-IR. Concentration of HDL was inversely associated with gestational age at birth and birthweight z-score, whereas triglycerides and glucose_(t=120) were positively associated with birthweight z-score. Triglycerides, hs-CRP and VLDL were positively associated with placental weight. Furthermore, HDL, insulin, leptin and HOMA-IR were positively associated with duration of exclusive breastfeeding, while gestational leptin and adiponectin were positively related to the respective HM concentrations throughout lactation. Lastly, insulin and HOMA-IR in pregnancy were negatively associated with HM intake, but only between 1.0-3.49 months.

Conclusions: Our results indicate that overweight prior to pregnancy may affect gestational inflammation and metabolism, which could further affect birth-related and breastfeeding outcomes. Acknowledgements: Funded by Bill & Melinda Gates Foundation.