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Abstracts

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Plenary Session 1: Human Milk and Breastfeeding

BENEFITS OF BREAST FEEDING

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Human milk is the gold standard for infant feeding. Breast feeding benefits extend beyond the properties of human milk content. A complex of nutritional, environmental, socioeconomic, psychological as well as genetic interactions establish a massive list of advantages related to breast feeding and health outcomes, for the breast fed infant and to the breastfeeding mother. Benefits for the breastfed infant include reduced mortality due to infectious diseases, reduction in the incidence and prevalence of diarrhea, lower respiratory tract infections, otitis media, and possibly on intelligence, overweight and obesity and type 2 diabetes. Benefits to the breast feeding mother include reduction in the prevalence of breast cancer and possible reduction in ovarian cancer and type 2 diabetes. Exclusive breast feeding is recommended for about 6 months and should be continued as long as mutually desired by mother and child.

Evidence on the association between breastfeeding and health outcomes is based on observational studies. Thus, many confounders, known and unknown may be present and the recommendation to breast feed should be based on considerations other than health outcomes.

Parallel Session 1: Nutrition and Medical Interventions in Linear Growth

NUTRITIONAL INTERVENTION IN SHORT AND LEAN ADOLESCENTS: DESCRIPTION OF AN ONGOING STUDY DESIGN WITH GENDER SPECIFIC SUPPLEMENTATION

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During the life-time of an individual, growth during adolescence is faster than at any other time period except during the first year of life. Adolescence can be the second opportunity for catch-up growth if environmental conditions and especially nutrient intake are favorable. Hence, adolescence is a nutritionally critical period of life. During the pre-pubertal phase the nutritional needs of males and females are the same, but during puberty the nutritional needs differ. The reasons for these gender differences include the earlier maturation of females and variations in the physiological need for some nutrients, e.g. protein, iron and the B-vitamins. Boys experience increased linear growth, produce a heavier skeleton and gain more muscle mass than fat mass compared to girls. These differences in body composition have important implications for the nutritional needs of adolescent boys and girls.

We recently reported a significantly positive dose-dependent effect of nutritional supplementation on linear growth in a one-year intervention trial with experimental formula (developed in the Institute for Endocrinology and Diabetes, Schneider Children's Medical Center of Israel) in short and lean, healthy pre-pubertal children (3-9 years of age)^{1,2}. Encouraged by these results, we have developed new gender-specific nutritional supplementations aimed to promote the linear growth of short and lean adolescent boys and girls. These nutritional supplementations are being evaluated in two separate (boys/ girls) multicenter double-blind placebo-controlled trials.

1. Lebenthal et al. J Pediatr 2014;165:1190-1193.
2. Yackobovitch-Gavan et al. J Pediatr 2016;179:154-159.

Parallel Session 1: Nutrition and Medical Interventions in Linear Growth

WHEN IS GROWTH HORMONE INDICATED?

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Since biosynthetic growth hormone (GH) became available (1986), the number of approved indications has steadily increased. There is no gold standard for the diagnosis of GH deficiency (GHD), so that only its likelihood can be estimated based on clinical, biochemical and imaging characteristics (growth pattern, IGF-I, IGFBP-3, GH provocation tests, exclusion of other disorders, bone age delay, cranial MRI). While in a minority of patients the diagnosis is virtually certain (multiple pituitary deficiencies, anatomical abnormalities, genetic defects), the group of idiopathic isolated GHD is much greater. At retesting in late adolescence, most of these cases show a normal GH peak in a provocation test, suggesting an initial false-positive diagnosis, although the existence of transient GHD has also been suggested. Other diagnoses registered for GH treatment in affluent countries include short children born small for gestational age (SGA), Turner syndrome, chronic renal failure, Prader-Willi syndrome, SHOX haploinsufficiency, and in some countries Noonan syndrome and idiopathic short stature. In severe GHD, GH treatment leads to a fast catch-up growth toward the genetic target height (TH), followed by a maintenance phase, a normal pubertal growth spurt and an adult height close to TH, while body composition normalizes. In non-GHD conditions, the effect on growth and adult height is variable. In children with the GH-sensitive variant of primary IGF-I deficiency, GH may also be effective. It has been difficult to objectify with quality of life questionnaires the clinical impression that short children may suffer of being short, which may be alleviated by GH treatment.

Parallel Session 2: Pre-Term Nutrition

MOTHERS' OWN MILK, DONOR MILK, OR INFANT FORMULA - WILL WE EVER PREVENT NEC?

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Background and Aims

Under most circumstances, mother's own milk is the best diet to protect preterm infants against necrotizing enterocolitis (NEC). Still, the optimal diet, start time and feeding advancement rates remain controversial and mother's own milk is not always available. Studies in appropriate animal models may help to answer basic questions about feeding practice, species-specificity of milk and milk processing for preterm infants.

Methods

Preterm pig studies.

Results

Preterm pigs are hypersensitive to suboptimal milk and may help to define the most important diets and feeding regimes for preterm infants. In preterm pigs, intact, raw milk is a better source of bioactive components than infant formula. Both porcine and bovine colostrum are optimal and the stage of lactation markedly affects the quality of milk for immature newborns. Human milk has beneficial effects on gut protection in preterm pigs, especially if provided raw or mildly-treated, relative to heat-pasteurized. The source of milk may be less important than the processing of milk, and a slow and early advancement of feeding volume is better than a late and fast feeding advancement. The immature intestine is highly sensitive to excessive fermentation of undigested nutrients and bacterial overgrowth, including that induced by excessive intake of oligosaccharides. Intact milk fats, lactose and whey proteins have superior protective effects, relative to processed nutrients of vegetable origin.

Conclusions

Milk has nutritional and gut-protective effects that are species-, lactation- and processing-specific. These milk qualities are particularly important to take into consideration for NEC-sensitive preterm infants but could be important for all infants.

Parallel Session 3: Growth and Growth Monitoring

WHO VERSUS NATIONAL GROWTH CHARTS

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The world-wide variation in human growth has exhaustively been studied. Between-population differences in developmental tempo of more than two years at age of puberty, as well as differences in mean adult height of more than 20 cm, have been documented since the mid-18th century, and have traditionally been attributed to nutrition, health, genes and general living conditions. Emphasizing the global similarity in infant and child growth under affluent conditions, the World Health Organization (WHO) promotes the use of a single global normative standard. Following this rationale, some 165 million children under age 5 suffer from linear growth failure and are considered “stunted” (defined as height -2 SDS below standard). Stunting is claimed to be the most common form of undernutrition and a major public health priority, coinciding with increased morbidity and mortality and reduced physical, neurodevelopmental, and economic capacity. The process is believed to be an intergenerational cycle of poverty and reduced human capital.

The use of globally applicable height cut-offs has raised criticism. WHO growth charts are about 1 SDS below current Northern European charts, and at present, about 1 SDS above healthy Indonesian and other South Asian and Latin American children. Does this imply clinically relevant misclassification of stature in these countries? In view of the historic and present-day variability in height, we will discuss global versus local growth charts, and present the concept of so-called “Synthetic Growth References”

Parallel Session 4: Vitamin D and Growth

VITAMIN D AND BONE MINERALIZATION DURING GROWTH

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Bone growth during childhood is related to later peak bone mass (PBM) obtained in different ages depending on which bone sites are measured. Approximately 80-90 % of PBM is reached in teenage years. PBM is considered as one of the most important factors for risk of osteoporosis in elderly. A ten percent higher bone mass density (BMD) in elderly has been related to a fifty percent lower risk of hip fractures. Furthermore BMD is also related to fracture risk during childhood. Maximizing bone growth during childhood with only a few percentages may have considerable effects later in life and maybe already in childhood and adolescence. It is well know that vitamin D is important for calcium absorption and severe vitamin D deficiency during infancy and childhood may lead to development of rickets especially during periods with high growth velocity. It has therefore been hypothesized that increasing vitamin D levels early in life especially in children with low vitamin D status may be important for bone mineralization and PBM and thereby reduced fracture risk later in life. The evidence for these assumptions will be discussed.

Parallel Session 4: Vitamin D and Growth

"TEST ME AND TREAT ME":THE MEDICALIZATION OF VITAMIN D DEFICIENCY

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Between 1995 and 2015 vitamin D related publications have quadrupled, and media coverage of vitamin D related topics has increased exponentially. The interest was driven by its touted pleiotropic effects (based largely on observational research), and the seductive simplicity with which “better” vitamin D status is theoretically achievable. Therefore, many primary care clinicians now include vitamin D serum level as part of their patients’ routine laboratory work and many practitioners recommend vitamin D, often at high doses, to prevent many health conditions like cardiovascular disease, diabetes, autoimmune disorders, cognitive decline and others. The USPSTF had determined that data is insufficient to recommend vitamin D screening in clinical practice, and the IOM had questioned whether supplemental vitamin D lowers risk of non- skeletal health outcomes. Still, vitamin D tests soar. In Australia, rate of vitamin D testing increased 94- fold from 2000 to 2010, while in the same time period there was only a 50% increase in bone density tests and number of CBCs remained stable. Eighty percent of tests were ordered by GPs and 20% by specialists. Similar findings from children tested in Israel will also show that 75%, 18% and 5% of children were tested once, twice and thrice respectively. There is an urgent need to limit unnecessary vitamin D testing in primary care.

Parallel Session 4: Vitamin D and Growth

VITAMIN D, SHOULD WE FORTIFY OR SUPPLEMENT?

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Recent new prevalence data for Europe highlights that vitamin D deficiency and inadequacy (defined as a serum 25-hydroxyvitamin D <30 and <50 nmol/L, respectively) across various age groups, including the pediatric population, is a problem. This has significant implications for human health throughout the lifecycle and impacts on healthy growth and development and successful aging. Low vitamin D status arises due to limited, if any, dermal synthesis during the winter months at latitudes above 40°N, coupled with public health skin-care advice to limit summer sun exposure, putting increased importance on dietary supply of the vitamin. However, dietary intakes by most populations are low due to the limited supply of vitamin D-rich foods in the food chain. Thus, safe and sustainable strategies that effectively address this public health issue are urgently required. It has been highlighted that there are only a limited number of such strategies available to correct low dietary vitamin D intake. While nutritional supplements contribute a high proportion to total vitamin D intake among users, supplement uptake is voluntary, and tends to be highest among infants and elderly adults and lowest among children, adolescents and young adults, who are also at risk of vitamin D deficiency. While vitamin D fortification (mandatory/voluntarily) of food has been viewed by some as a feasible and effective measure once applied in an evidence-based approach, it also has some challenges and barriers. These key issues, which colour whether we should we fortify or supplement with vitamin D, will be overviewed.

Parallel Session 5: Malnutrition and Growth Impairment in Low and Middle Income Countries

ASSESSMENT OF LINEAR GROWTH OF CHILDREN IN LOW- AND MIDDLE-INCOME COUNTRIES

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Childhood stunting is prevalent in low- and middle-income countries (if compared with a global standard) and is associated with long-term adverse neurodevelopment and health outcomes. To objectify growth in clinical and epidemiological research, various indicators can be used, which all present challenges in their analysis and application.

Linear growth is commonly expressed as length or height-for-age z-score (HAZ) in comparison to national descriptive growth references or global normative standards. HAZ can not only be expressed as continuous variable, but can also be categorized (normal versus stunting, or two or three categories of stunting). Since HAZ is associated with birth length and weight, and prior measurements, conditional HAZ can be calculated, defined as current height accounting for previous height(s). In longitudinal studies, growth can be expressed as the change of HAZ over time. The change of HAZ between two timepoints can also be expressed as a z-score, using the correlation between the first and second HAZ. In infants (0-24 months), height velocity z-score can be calculated, but suitable computer algorithms are lacking. Multi-level modeling is preferable when more measurements per individual child are available over time. Adjusting for covariates or confounders (eg, birth weight, parental height, maternal education, socioeconomic status) is recommended in growth analyses.

In conclusion, the most suitable indicator(s) for linear growth can be selected based on the number of available measurements per child and the child's age. By following a step-by-step algorithm, growth analyses can be accurately performed to allow for improved comparability within and between studies.

Parallel Session 8: What Determines Our Final Adult Height?

A CENTURY OF TRENDS IN ADULT HUMAN HEIGHT, DATA FROM 200 COUNTRIES

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Background: Being taller is associated with enhanced longevity, lower risk of adverse pregnancy outcomes and cardiovascular and respiratory diseases, higher risk of some cancers, and higher education and earnings. Our aim was to estimate the height of adults born from 1896 to 1996 for all countries in the world.

Methods: We reanalysed 1,472 population-based height measurement studies with 18.6 million participants born between 1896 and 1996 to obtain mean height by birth cohort, age group and sex. We used a Bayesian hierarchical model to estimate trends in adult height in 200 countries and territories.

Results: The largest gains in height occurred in South Korean women who became 20.2 cm (17.5–22.7) taller over the century of analysis. In contrast, there was little change in adult height in some sub-Saharan African countries, especially for men, and in South Asia. Adult height has decreased in many sub-Saharan African countries since the early-1960s birth cohorts, and more recently among men in some countries in Central Asia, Middle East and North Africa. The tallest people are men born in the Netherlands, at 182.5 cm (180.6-184.5), and the shortest were women born in Guatemala in 1896 whose average height was only 140.3 cm (135.8-144.8).

Conclusions: Over the past century, adult height has changed substantially and unevenly, including an early flattening or even loss of adult height in some of the poorest regions. Height in early adulthood constitutes a measurable indicator of sustainable human development, with links to health and longevity, nutrition, education and economic productivity.

Parallel Session 8: What Determines Our Final Adult Height?

MAJOR DETERMINANTS OF STUNTING IN LOW INCOME COUNTRIES

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Childhood stunting is a major determinant of reduced adult height. It is estimated that 162 million children below 5 years are stunted. Although, there is a decline it is slow and one of the Global Nutrition Targets of the World Health Assembly is therefore that the number of stunted children should be cut by 40% by 2025. The causes of stunting are complex. Global data show a marked reduction of height-for-age Z-scores up to the age of 2 years with no further decline up to 5 years. Thus the first 1000 days play a central role. Intrauterine growth retardation caused by maternal malnutrition is important and can be difficult to reverse after birth. Optimal breastfeeding and complementary feeding with nutrient-rich foods, e.g. animal foods, dietary diversity and micronutrient supplements is important to support early linear growth. There is also increasing awareness of how intestinal infections, subclinical infections and subclinical inflammation (environmental enteric dysfunction) have a negative impact on growth and how important it is improve water, sanitation and hygiene (WASH) to prevent stunting. Although the first 1000 days are important, longitudinal data from Gambia and other low-income countries have shown that there is also a potential for catch-up after 24 months, especially around adolescence. Stunting is associated with reduced cognitive development, productive capacity and increased risk of metabolic diseases e.g. type 2 diabetes. Prevention is therefore important but complex and challenging.

Oral Presentations Session 1: Neonatal & Prematurity I

AN ANTHROPOMETRIC MODEL TO SCREEN FOR LOW AND HIGH NEONATAL BODY FAT, USING AIR DISPLACEMENT PLETHYSMOGRAPHY AS A CRITERION METHOD

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Background and Aims

Current validated neonatal body composition methods are limited for use outside a clinical environment and are particularly impractical in low-middle income settings. The aim of this study was to develop models suitable for resource poor settings, employing anthropometric measures to screen for low-fat and high-fat neonates, using air displacement plethysmography (ADP) as the criterion method.

Methods

Eligible neonates were term, well, and born at Royal Prince Alfred Hospital, Sydney in 2010. Measurements included body composition (%Body Fat) by ADP and head, mid-upper arm, thigh, abdominal and chest circumferences. Sex-specific low and high-fat cut offs were defined as 1 standard deviation (SD) below and above the mean, respectively. Two multivariable logistic regression models were developed to screen for low-fat and high-fat neonates using the anthropometric features. A linear regression model was also fitted for prediction of fat mass (FM).

Results

581 neonates enrolled in the study (75% recruitment rate) and n=528 neonates had valid measurements. The fitted logistic regression models for low and high-fat exhibited area under receiver-operator characteristic curves (AUC) of 0.82 and 0.83, respectively. The low-fat model was fitted using birth weight, head, mid-thigh and mid-upper arm circumferences. The high-fat model was based on birth weight, chest and head circumferences and gestational age. A multiple linear regression model was developed to estimate FM, with an R-squared of 0.61.

Conclusions

The anthropometric model to screen for low and high-fat neonates may be of use for monitoring in low-middle income settings with 61% of variance explained by the model.

Oral Presentations Session 1: Neonatal & Prematurity I

THE 12 MONTHS FOLLOW-UP OF THE GROWTH AND THE DEVELOPMENT OF 445 PRETERM INFANTS

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Background and Aims

To follow up the growth pattern of preterm infants during the first year and explore the association between head circumference and neurodevelopment sequences.

Methods

445 preterm neonates who had their routine physical examination from January 2012 to July 2014 at the Child Health Care Department of The Second Hospital of Sichuan University were enrolled. All the infants' age were corrected to 40 weeks. Anthropometries were obtained every month before 6 months-old and every 2 months from 6 to 12 months. Z scores were calculated by WHO Anthro software. Neurodevelopment was assessed at 12 months-old by using DDST.

Results

64 VLBW, 246 LBW and 135 normal birth weight infants were followed. There were 96 SGA infants among which 30 were VLBW and 66 were LBW infants. The incidence of SGA was 46.9%(30/64) in VLBW and 26.8%(66/246) in LBW respectively. The HCZ was -1.17(95 % CI: -1.53,-0.80; P < 0.0001) lower during the 12 months. WAZ was -1.12(95 % CI: -1.47,-0.76; p<0.0001) lower. WHZ and HAZ were -1.04 (95%CI:-1.38, -0.69; P<0.0001) and -0.69 (95%CI:-1.06,-0.33; P<0.0001) lower respectively. Growth of SGA infants was poorer than that of AGA. The rate of DQ<70 in VLBW and LBW were 29.6% and 7.7%, respectively (P<0.0001). HCZ <-1SDS at 3 months emerged as an independent predictor of DQ scores below 85 at 12 months after birth.

Conclusions

The catch-up growth was observed in most preterm infants. VLBW and SGA showed poorer growth than other groups. Z score for HC at 3 months<-1SDS was a significant risk factor for abnormal DQ scores at the first year.

Oral Presentations Session 1: Neonatal & Prematurity I

GROWTH RATE AND DEVELOPMENTAL QUOTIENT OF NON-BREASTFED LOW BIRTH WEIGHT PRETERM INFANT DURING THE FIRST YEARS

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Background and Aims

The objective of growth measurements of LBW-preterm infants during neonatal period is to maintain the growth rate to the same gestational age, and its positively associated with long-term developmental outcomes. The most common way to express the child developmental status is the use of the Developmental Quotient (DQ). The aim of this study was to determine the correlation between the growth rate and the early DQ in the first year period of non-breastfed LBW-preterm

Methods

A total of 57 eligible LBW-preterm infants were studied prospectively. The growth rate was calculated from adding the size (weight, length and head circumference) per week from birth until the age of 40 weeks. The DQ was assessed using The Cognitive Adaptive Test/Clinical Linguistic and Auditory Milestone Scale (CAT/CLAMS) at the corrected age of 4 and 8 months as CAT-DQ, CLAMS-DQ and Full Scale (FS)-DQ. Statistical analysis using correlation test, with $p < 0.05$ being considered significant

Results

The weight growth rate was not correlates with CAT-DQ, CLAMS-DQ or FS-DQ either to 4 months or 8 months. The length growth rate correlates significantly with 4 months FS-DQ ($r = 0.298$; $p = 0.024$), and the head circumference growth rate correlates significantly with 4 months CAT-DQ ($r = 0.280$; $p = 0.035$) and FS-DQ ($r = 0.332$; $p = 0.012$)

Conclusions

Measurement of all parameters of growth rate during the neonatal period in non-breastfed LBW-infants is an essential activity to the interests of long-term developmental outcomes assessment. That is because each of these parameter correlated with different parameters of development

Oral Presentations Session 1: Neonatal & Prematurity I

PRETERM AND TERM INFANTS: BODY COMPOSITION AND LIPOPOLYSACCHARIDE LEVEL

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Background and Aims

Adipose tissue is now recognized to produce inflammatory factors, probably due to increased endotoxin concentration. This study was aimed to compare body composition of preterm infants measured at term equivalent age, with body composition of term infants, and to assess the correlation between body fat percentage (BF%) and endotoxin (ET) level in blood plasma.

Methods

Cross-sectional study included 314 preterm and 386 full-term infants. Body composition using air-displacement plethysmography at gestational age 37-42 weeks was assessed. In 43 infants the concentration of lipopolysaccharide (LPS) was determined by micro-LAL-test.

Results

BF% increased with decreasing of GA (table1), BF% of infants born at 32 weeks of gestation or less was significantly higher than that of full-term ($p=0,000001$), while no significant difference was noted between the infants born at 33 weeks and over, in comparison with full-term newborns. In infants with concentration of LPS 0.3-0,9 EU/ml BF% was significantly higher compared to the newborns whose LPS values ranged 1,2-4,8 EU/ ($15,2 \pm 2,38\%$ vs $10 \pm 0,37\%$, $p < 0,05$).

GA, weeks	n	BF%	fat mass, g	body mass, g	length, cm
<28	39	18,42±0,8	478 ± 34	2499 ± 0,1	45,6 ± 0,44
28-29	34	17,96±0,9	466 ± 37	2516 ± 0,12	46,4 ± 0,63
30	33	16,63±0,7	410 ± 33	2381 ± 0,1	46 ± 0,48
31	20	15,89±0,9	364 ± 38	2232 ± 0,13	44,7 ± 0,85
32	32	17,02±0,8	416 ± 27	2422 ± 0,09	46,1 ± 0,56
33	33	13,58±0,74	311 ± 27	2225 ± 0,11	44,5 ± 0,71
34	20	10,7±0,9	268 ± 27	2452 ± 0,08	46,8 ± 0,57
35	33	10,78±0,7	276 ± 23	2493 ± 0,09	47,2 ± 0,68
36	70	9,72±0,5	254 ± 16	2557 ± 0,06	48,1 ± 0,31
≥37	386	12,27±0,3	438 ± 12	3412 ± 0,04	51,9 ± 0,16

Conclusions

Postnatal increase of BF% in preterm babies under 33 weeks' gestation is more pronounced than intrauterine increase of BF% in full-term infants. The concentration of LPS in the blood is inversely proportional to BF%, indirectly indicating the ability of adipose tissue to deposit LPS. Therefore, lipolysis can lead to a pronounced increase of ET in newborns aged 32 weeks and less.

Oral Presentations Session 1: Neonatal & Prematurity I

LOW BIRTH WEIGHT, EARLY POSTNATAL GROWTH AND NEURODEVELOPMENTAL OUTCOMES : A SYSTEMATIC REVIEW

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Background and Aims

Catch-up growth (CUG) is currently a therapeutic goal to preserve brain development for children born with low birth weight (LBW) in spite of limited evidence. On the other hand, many studies show an association between rapid early postnatal growth and subsequent cardiovascular risk. The aim was to perform a systematic review of the relationship between early postnatal growth and neurodevelopmental outcomes in children born with LBW taking into account prematurity and size at birth.

Methods

Applying the PRISMA guidelines, three independent investigators conducted a systematic review using Web of science, Embase and Medline databases to identify published studies from their inception to 2016. All studies reporting an association between growth before three years and later neurodevelopmental outcomes in individuals born small for gestational age (SGA, at term or moderately preterm), or moderately preterm or with a LBW (1500 to 2500 g) were selected.

Results

Seventeen articles, relying on nine distinct studies, met inclusion criteria. Most studies identified a positive association between early postnatal growth and cognition, especially with IQ when available. However, no meta-analysis could be performed because of a lack of standardization of growth analysis methods between studies. Four studies (including 2 cohorts) showed that CUG in the 4 first months of life was most strongly positively associated with later cognition in moderately preterm and SGA term-born populations.

Conclusions

More appropriate methods are needed to explore the causality of this positive association between early postnatal growth and cognition, and especially to disentangle the respective role of CUG and birth condition in this relationship.

Oral Presentations Session 1: Neonatal & Prematurity I

GROWTH VELOCITY OF PRETERM INFANTS - ANALYSIS AND RECOMMENDATIONS

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Background and Aims

Existing preterm growth literature is difficult or impossible to compare between studies because of a wide variety of different growth velocity calculation methods. Exponential growth rate calculations are recommended for preterm infants. While fetal growth increases exponentially through to ~ 36 weeks, it then slows. If early exponential gains were prolonged, infant growth patterns would appear as skyrocketing curves. The purpose of this work was to directly compare varied growth velocity methods using the same sample.

Methods

Direct comparisons of various growth velocity calculation methods were applied to 98 preterm (<1500 gram, < 29 week) infant measurements for the first 105 days of life: daily in hospital and weekly post discharge measures. We also evaluated whether the clinical velocity precision improves as number of days increases from 1 to 7.

Results

Calculation of growth velocity after physiological weight loss is useful to assess infant growth relative to fetal growth. When the early physiological weight loss phase was included in a growth velocity calculation, the results deviated from fetal rates. Clinical velocity precision improved with 5-7 days compared to 1-3 days, as reflected by narrower confidence intervals 42% as wide.

Conclusions

Some minor changes in growth velocity calculation methods provide results that could be compared between studies and provide confidence in clinical applications. For short term growth velocity calculations for clinical assessments, calculations for periods less than 5-7 days have less precision.

Oral Presentations Session 1: Neonatal & Prematurity I

GROWTH PATTERN AND FINAL HEIGHT OF VERY PRETERM VERSUS VERY LOW BIRTH WEIGHT INFANTS

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Background and Aims

Although pregnancy dating can be reliably assessed with ultrasound nowadays, birth weight (BW) is still used as a surrogate for gestational age (GA) by many studies concerning preterm birth. Using a cohort of infants born very preterm (VP, GA <32 weeks) or with very low birth weight (VLBW; BW <1,500 grams), we aimed to quantify the impact of these entities on postnatal growth and final height.

Methods

Subjects born VP and/or with a VLBW from the Project On Preterm and Small-for-gestational-age infants cohort were classified as: (1) VP+/VLBW+ (n=495), (2) VP+/VLBW- (n=207) or (3) VP-/VLBW+ (n=296) infants. Weight, length/height and head circumference (HC) were measured at birth, 3, 6, 12 and 24 months corrected age, and at 5 and 19 years. Data were analyzed longitudinally.

Results

Birth size was much smaller in the VP-/VLBW+ group compared to the VP+/VLBW+ and VP+/VLBW- groups (-2.8±0.1 vs. -0.4±0.1 vs. 0.5±0.1 standard deviation (SD) -score for weight, and -2.6±0.1 vs. -0.2±0.1 vs. 0.3±0.1 SD-score for length). During childhood, length, weight and HC SD-scores increased in the VP-/VLBW+ group, while the SD-scores in the VP+/VLBW+ and the VP+/VLBW- groups remained stable or decreased. Despite catch-up growth, VP-/VLBW+ infants remained the shortest and lightest at age 19.

Conclusions

The terms VP and VLBW impact growth differently, as evidenced by different growth patterns for infants born VP+/VLBW+, VP+/VLBW- or VP-/VLBW+, and are therefore not interchangeable. Consequently, for future studies we recommend, at least for industrialized countries, including preterm infants based on GA instead BW.

Oral Presentations Session 1: Neonatal & Prematurity I

GASTRIC EMPTYING IN LATE PRETERM INFANTS : BREAST MILK VERSUS INFANT FORMULAS

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Background and Aims

Successful enteral nutrition of the late preterm infant is both an important objective and challenge as impaired gastrointestinal motility often limits introduction of milk ,Gastric emptying in preterms is a subject of great concern .

ultrasound has been used to determine gastric-emptying patterns in preterm infants using antral cross sectional area (ACSA) measurements, The ACSA is the most common method used in assessing gastric emptying in the preterm infant and it is technically simpler to perform than the direct stomach measurement. This study aims to study gastric emptying of premature standard formula and high calorie formula versus breast milk in late preterm infant(LPI)

Methods

A case control comparative study where 60 late preterm infants (LPIs) recruited from NICU Children's Hospital Ain shams university were divided into 3 groups group(1) 20 LPIs received premature standard formula ,group (2) twenty LPIs received high calorie formula and group (3) LPIs were given expressed breast milk (EBM) .Gastric emptying was assessed using ASCA measurements prefeed and postfeed and at 30-minute intervals thereafter

Results

The current study showed faster half emptying and full gastric emptying in control group (EBM) followed by group of high calorie formula followed by premature formula ($p < 0.003$).

Conclusions

The nature and composition of milk play an important role in the physiology of gastrointestinal motility and gastric emptying of the stomach. Gastric emptying times are different in neonates according to type of feeding either breast feeding (BF) or formula feeding (FF).

Oral Presentations Session 1: Neonatal & Prematurity I

SUPERIMPOSING INTRAUTERINE AND POSTNATAL GROWTH CHARTS TO VISUALIZE START, TYPE, AND SEVERITY OF INTRAUTERINE GROWTH RETARDATION, AIDING THE INTERPRETATION OF POSTNATAL GROWTH IN INFANTS

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Background and Aims

Two types of intrauterine growth retardation (IUGR) have been identified, both having different etiologies and outcomes. In asymmetric IUGR, the most common type, we first see retarded growth in weight, followed by length, whereas in symmetric IUGR, we see retarded growth in both dimensions simultaneously.

Visualizing both postnatal and, after the necessary conversions, intrauterine measurements into a single growth chart might help neonatologists in interpreting and understanding the postnatal growth in infants diagnosed with IUGR. Contrary to a diagnosis code, visualization differentiates individuals on type, start, and possibly trend or severity, and will constantly keep a focus on possibly hidden diagnoses, such as certain syndromes in case of asymmetric IUGR.

Methods

The Dutch ultrasound references for femur length (FL), estimated fetal weight (EFW), and head circumference (HC) for gestational age, and the Dutch growth references for length, weight, and head circumference for age were selected. For superimposition of FL and length, the FL reference and measurements have been converted into fetal length equivalents using a prediction formula. Intrauterine gestational ages are translated around the patient's gestational age at birth.

Results

The superimposition has been developed successfully. With adjustments implementation in Growth Analyser Viewer Edition, a digital growth chart module for electronic health records, is feasible. For patients, the module could then create superimposed growth charts individualized on gender and gestational age at birth automatically.

Conclusions

Development has shown that superimposition of intrauterine and postnatal data is possible. Practice now should objectively assess its aided value.

Oral Presentations Session 2: Obesity I

ETHNIC DIFFERENCES IN CHILDHOOD OBESITY IN THE UK

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Background and Aims

The National Child Measurement Programme in the UK recently showed that children from Black and South Asian backgrounds were more likely to be overweight than those from a White background, with those from a Chinese background having lowest levels of overweight. little research has explored why these variations might be occurring in a UK sample. Limited research has considered differences in genetics, nutrient intake and physical activity level between ethnic groups as a variation but research has not considered how known psychosocial influences on child obesity may differ. One such influence on childhood obesity is maternal child-feeding style with variations seen in this between ethnic groups in countries such as the USA. Therefore the aim of the current study was to explore this in a UK sample.

Methods

659 mothers from diverse ethnic backgrounds (White, Black, South Asian, and Chinese) with a school aged child 4 – 11 completed copies of the Child Feeding Questionnaire and Parental Feeding Style Questionnaire.

Results

Scales were compared between ethnic groups showing significant differences in use of pressure to eat, emotional feeding and instrumental feeding. The means showed the highest levels amongst South Asian participants compared to all ethnic groups. Pressure to eat, emotional feeding and instrumental feeding have been linked to disregulated appetite control in children and as a consequence overweight.

Conclusions

The findings have important implications for understanding how cultural backgrounds might affect maternal feeding style and how these could be modified to reduce risk of childhood overweight.

Oral Presentations Session 2: Obesity I

DIETARY CALCIUM INTAKE IS ASSOCIATED WITH EXCESS WEIGHT AMONG LATIN AMERICAN ADOLESCENTS

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Background and Aims

Adolescent overweight and obesity has become a worldwide public health concern. Recent studies have demonstrated the existence of a regulatory role of calcium intake on body weight, but only a few have explored this association among adolescents. Besides that, high prevalence of calcium inadequacy is common regardless age and nutritional status.

OBJETIVE: To assess the relationship between usual calcium intake and prevalence of excess weight in Latin American adolescents.

Methods

Data were obtained from 1.223 adolescents (15-19 years old) participating in Latin American Health and Nutrition Study (ELANS), a multicentric study developed in urban areas of Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru and Venezuela. Prevalence of calcium inadequacy was based on usual intake, assessed by two 24-hour recall. Population was divided into tertiles of calcium consumption. Nutritional status was defined according to BMI-for-age percentiles.

Results

The prevalence of excess weight was similar between boys (25.2%) and girls (29.3%), $p=0.103$. As expected, mean calcium intake was higher in boys ($636.9\pm 269.3\text{mg/d}$) than girls ($552.9\pm 238.0\text{mg/d}$), $p<0.001$. Peruvian boys and Costa Rican girls showed the lowest calcium intake $467.6\pm 152.3\text{mg/d}$ and $404.3\pm 156.8\text{mg/d}$, respectively. Prevalence of calcium inadequacy was 90.76%, boys (88.7%) showed highest prevalence than girls (93.3%), $p<0.05$. High calcium intake tertile group ($863.4\pm 199.2\text{mg/d}$) presented lower prevalence of excess weight than the first tertile ($330.4\pm 75.5\text{mg/d}$), 21.1% and 33.2%, respectively ($p<0.001$). Similar results were observed for all countries.

Conclusions

Nine out of ten adolescents didn't meet the recommendation for calcium intake. Lower intake of calcium was associated with higher prevalence of excess weight.

Oral Presentations Session 2: Obesity I

AGE OF ONSET OF SOCIAL INEQUALITIES IN BODY MASS INDEX AND OVERWEIGHT: THE EDEN MOTHER-CHILD COHORT

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Background and Aims

Many studies have shown an inverse association between socioeconomic status and overweight in children. This association has been suggested to increase with age. Children who are overweight are more likely to remain overweight in adulthood, thus reinforcing social inequalities in health over the life course. The few studies that have investigated the age of onset of this inverse association, suggested that this appears between 2 and 6 years.

To identify the age of onset of the inverse association between maternal education and both body mass index (BMI) and overweight in France.

Methods

Using the Jenss model, we fitted individual weight and height growth trajectories and predicted weight, height and BMI at 1 month, 6 months, 1 year, 3 years and 5 years for 1764 children from the EDEN cohort. Overweight status between 2 and 5 years was defined according to International Obesity Task Force references. Associations between maternal education and both BMI and overweight were analysed using marginal linear and logistic models, respectively.

Results

An inverse social gradient was found for BMI around 1 month of age. Whereas it was no longer significant at 1 year, the inverse association between maternal education and BMI was found again around 3 years and maintained thereafter. The inverse social gradient of overweight was observed from 2 years on.

Conclusions

We found that the inverse relationship between maternal education and the BMI is set in the first months of life, stressing the precocity of the onset of social inequalities in growth trajectories.

Oral Presentations Session 2: Obesity I

EATING BEHAVIOUR AND GROWTH IN EARLY CHILDHOOD

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Background and Aims

Childhood obesity develops early in childhood, with 3% of French children already obese at 5 years. However, few studies examined the association between early eating behavior and obesity development. The objective was to examine the links between eating behavior and growth in children up to age 5 years.

Methods

Analyses were based on 1,142 children from the EDEN mother-child cohort. Child's appetite was assessed at 4 and 8 months and 1, 2, 3 and 5 years, child's food neophobia at 1, 2, 3 and 5 years and energy intake (only among infants non breastfed during the 3-d food record) at 4, 8 and 12 months. Individual height and weight growth curves were modeled from data collected during clinical exams or from the health booklet. Associations between eating behaviour and predicted weight or BMI were tested by linear regressions.

Results

Among non-breastfed children, high energy intake (highest tertile) at 4 and 8 months were related to both higher weight and higher BMI, from 1 to 5 years. Among all children, high appetite (child considered as always hungry) was more strongly related to BMI than to weight, with a positive association with high appetite from 1 year and current or subsequent BMI. High food neophobia (highest tertile) at 1 year was related to lower BMI at 1 and 2 years, but the association was no more significant for older ages.

Conclusions

As early as in infancy, higher perceived appetite and lower food neophobia were related to higher subsequent BMI.

Oral Presentations Session 2: Obesity I

WHO EUROPEAN CHILDHOOD OBESITY SURVEILLANCE INITIATIVE: ASSOCIATION BETWEEN EXCLUSIVE BREASTFEEDING AND OVERWEIGHT/OBESITY IN 6-9-YEAR-OLD SCHOOLCHILDREN

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Background and Aims

Overweight and obesity rates in children have increased at alarming rates. Breastfeeding has been suggested to reduce the risk of later childhood overweight and obesity. However, this protective effect is still subject of considerable debate. This study aimed to investigate the association between exclusive breastfeeding and obesity/ overweight in schoolchildren.

Methods

Data from Bulgaria, Czech Republic, Lithuania, Portugal and Sweden participants of the European Childhood Obesity Surveillance Initiative (school year 2008/2009 and 2009/2010) were used. Using cross-sectional nationally representative samples of 6–9-year-olds (n= 14 642), we performed logistic regression analyses to assess the effect of ≥ 6 months of exclusive breastfeeding compared with shorter or no breastfeeding on overweight and obesity. Models were adjusted for mother's education, occupation and country of residence.

Results

Highest prevalence of exclusive breastfeeding was observed in Sweden (73.5%) and lowest in Lithuania (34.2%). Bulgaria had the highest prevalence of "no breastfeeding" (13.7%). Portugal showed the highest prevalence of overweight (37.7%) and obesity (14.4%) and Swedish children had the lowest prevalence of overweight and obesity (23.0% and 6.4 % respectively). When compared to children breastfed for ≥ 6 months, non-breastfed children were 51% more likely to be obese (95% CI: 1.25, 1.83) and children breastfed < 6 months were 17% more likely to be obese (95% CI: 1.03, 1.32). In relation to overweight, the results were not statistically significant.

Conclusions

A protective and a dose-response effect of exclusive breastfeeding in relation to obesity was found. Policies that promote and encourage exclusive breastfeeding for the first 6 months of life must be reinforced.

Oral Presentations Session 2: Obesity I

ANTHROPOMETRIC AND CONTEXTUAL PREDICTORS OF OBESITY IN SCHOOLCHILDREN: THE CHILDHOOD OBESITY SURVEILLANCE INITIATIVE IN THE REPUBLIC OF IRELAND – 2010, 2012 and 2015

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Background and Aims

Projections suggest Ireland may become amongst the most obese countries in Europe within a decade. This study aims to investigate predictors of overweight and obesity among Irish schoolchildren for the last 5 years.

Methods

A nationally representative sample of 7,542 children (53.9% girls), mean age 10.4 (± 1.2 SD) years, participating in the Irish Childhood Obesity Surveillance Initiative (COSI) in 2010, 2012, 2015 waves were included. Height, weight and waist circumference were objectively measured by trained nutritionists in the same schools over time. The study followed the WHO COSI protocol, jointly developed by the WHO Regional Office for Europe and participating Member States. BMI was categorised according to International Obesity Task Force cut-offs. Associations between overweight/obesity and covariates were investigated by forward-stepwise logistic regression analyses.

Results

The overall prevalence of overweight/obesity was 22.5%. Age (OR=0.42; 95% CI=0.37-0.48) and height (OR=0.95; 95% CI=0.94-0.96) were inversely associated with risk of being overweight/obese, whereas being a girl (OR=1.68; 95% CI=1.40-2.02) or having high waist circumference (OR=1.56; 95% CI=1.53-1.60) increased the odds of being overweight/obese. Schoolchildren attending disadvantaged schools were more likely to be overweight/obese (OR=1.74; 95% CI=1.35-2.26). No associations were observed with the location of the school, i.e. urban vs rural.

Conclusions

The risk of overweight/obesity among Irish schoolchildren over the last 5 years was strongly associated with biological and anthropometric factors. Contextual factors were also strong predictors of overweight/obesity, mainly among children attending disadvantaged schools. Health promotion policies should target settings such as schools as well as individuals to achieve effective outcomes.

Oral Presentations Session 2: Obesity I

PREVALENCE OF OVERWEIGHT, OBESITY AND METABOLIC SYNDROME IN PEDIATRIC CANCER SURVIVORS – ROLE OF NUTRITIONAL INTAKE

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Background and Aims

Childhood cancer survivors (CCS) are known to have an increased risk of long-term complications such as obesity and metabolic syndrome (MS). The aim of the study is to assess the prevalence of overweight, obesity and metabolic syndrome in CCS and to evaluate possible correlations with diet, physical activity and therapeutic regimen.

Methods

Anthropometric measurements, clinical data, laboratory samples, dietary intake and physical activity level of 171 CCS were assessed during follow up visits (T2) and compared to weight and height measured at diagnosis (T0) and at the end of treatment (T1).

Results

Mean age of CCS was 11,3 years and 48,5% were males. Mean BMI z-score increased significantly at T1 ($p=0,019$) and T2 ($p<0,001$), compared to T0. 27% of patients were overweight or obese; 50% of the latter suffered Acute Lymphoblastic Leukemia. Prevalence of MS was 4% among eligible patients ($n=70$). Average nutritional intake exceeded the RDI of protein (210%), fat (105%) and saturated fat (107%), sugars (107%) and sodium (111%), whereas it was low in PUFA (47%), fiber (86%), potassium (65%), particularly low in calcium, iron (in 40% of CCS was less than 50% of requirement) and most of all vitamin D – none of the patients met the recommended intake. Nutritional intakes had no correlation with diagnosis, therapeutic regimen and body weight. Energy intake resulted more appropriate in active subjects (20% of CCS).

Conclusions

Nutritional intervention during follow up may limit weight gain and improve nutritional status as well as clinical and metabolic outcomes.

Oral Presentations Session 2: Obesity I

HOW HAS TRAJECTORY OF ADULT BODY MASS INDEX CHANGED OVER TIME: EVIDENCE FROM THE CHINA HEALTH AND NUTRITION SURVEY 1989-2011

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Background and Aims

Evidence on secular trends in BMI trajectories is limited, especially in countries experiencing marked socio-economic and nutritional transitions. We investigated how adult BMI trajectories have changed across generations in China.

Methods

We used (mixed) longitudinal data from the China Health and Nutrition Survey, which had ten waves between 1989 and 2011 (N~19,000). We derived five cohorts of adults born in three years intervals (1950-53, 1954-57, 1958-61, 1962-65, 1966-69). We fitted random effects cubic growth models to adult (≥ 20 y) BMI by sex.

Results

While mean BMI trajectories mostly lay in the normal BMI range, they increased over time, with later born cohorts having higher BMI than older cohorts. Increases were particularly evident between cohorts born in 1950-53 and 1953-69, and greater in early adulthood for women and similar across ages for men. BMI trajectories differed between urban and rural areas. Men from rural areas tended to have higher BMI than urban men in early adulthood, gained BMI at a slower rate with a lower mean BMI by mid-adulthood. Rural women had lower BMI than urban women in early adulthood, but they gained BMI at a faster rate, and by mid-adulthood there was little difference in mean BMI between rural and urban women.

Conclusions

While Chinese adults have a lower mean BMI than Western populations, their BMI trajectories have changed, with recent generations gaining BMI at younger ages. Changes of rural/urban differences in BMI trajectories suggest further research in changing patterns of socio-economic differences in disease risk in the Chinese populations is needed.

Oral Presentations Session 2: Obesity I

MATERNAL CAFFEINE INTAKE DURING PREGNANCY AND CHILDHOOD GROWTH AND OBESITY: RESULTS FROM THE NORWEGIAN MOTHER-CHILD COHORT STUDY

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Background and Aims

Maternal caffeine intake during pregnancy has been associated with lower birth weight. Fetal growth retardation is related with catch-up growth and childhood obesity. Our aim was to investigate the association between prenatal caffeine intake and early growth and obesity in childhood.

Methods

Our study includes approximately 50,000 mother-child pairs from the Norwegian Mother and Child Cohort Study. Total caffeine intake was calculated from a validated food frequency questionnaire answered in mid-pregnancy. Women were categorized as having low (0-49mg/day), average (50-199mg/day), high (200-299mg/day) and very high (≥ 300 mg/day) caffeine intake. Child's weight and height/length was reported by the mothers from 6 months to 8 years. Early growth was evaluated by WHO weight-for-age z-scores and an increase of more than 0.67 of the z-score from birth to 1 year was defined as "rapid growth". Overall growth was also studied. IOTF criteria were used to define overweight/obesity.

Results

Maternal caffeine intake was associated with higher risk for rapid growth in infancy, and a higher risk for overweight/obesity at 3, 5 and 8 years. Children born to mothers with very high caffeine intake had 62% higher risk for rapid growth in infancy. High and very high caffeine intake was also positively associated with increased weight gain and weight gain velocity.

Conclusions

Our results suggest that prenatal caffeine intake may change the normal growth trajectory of the child and be related with the onset of obesity; outcomes that have been associated with poorer health later in life.

Oral Presentations Session 3: Diet, Nutrition and Growth

MID-GESTATIONAL FETAL FRACTIONAL THIGH VOLUME AS EARLY MARKER OF NEONATAL FAT MASS

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Background and Aims

Prenatal markers are needed to predict the risk of neonatal adiposity as proxy of childhood obesity. Fetal fractional thigh volume (TVol) measured shortly before birth is associated with neonatal fat mass (FM). This study investigated the association between neonatal FM and TVol from mid-gestation onwards and TVol growth, measured on 3D-ultrasound (US) scans.

Methods

This perinatal cohort study was conducted between September 2014 and September 2016. Singleton pregnancies with term born neonates were included. Fetal TVol was measured on 3D-US scans performed at 22, 26 and 32 weeks of gestation. Neonatal body composition measurement (percentage body fat, %BF) was planned between 42⁺⁰ and 42⁺⁶ weeks postmenstrual age using air-displacement plethysmography (PEAPOD®). Associations between neonatal %BF and TVol (single measurements and TVol growth) were analyzed using linear regression.

Results

Seventy-nine mother-child pairs with 192 prenatal 3D-scans were included. Median (interquartile range) TVol increased from 7.6 (7.1;8.5) cm³ at 22 weeks to 36.5 (33.8;40.9) cm³ at 32 weeks. Median neonatal %BF was 14.3% (11.7;17.0). TVol at 22 weeks ($\beta=-1.58$, 95%CI-2.49;-0.67, explained variance 0.31) and to lesser extent TVol growth between 22 and 32 weeks negatively associated with %BF. TVols at 26 and 32 weeks were not significantly associated with %BF.

Conclusions

TVol in mid-gestation is associated with neonatal FM, with no clear additional value of serial measurements. In the future, TVol combined with other biomarkers, might be used to predict the risk of neonatal adiposity and as outcome measure to follow-up the effect of preventative strategies for childhood obesity.

Oral Presentations Session 3: Diet, Nutrition and Growth

MATERNAL PERCEPTIONS AND CONCERNS ABOUT THEIR INFANT AND YOUNG CHILD'S WEIGHT: ANALYSIS OF THE BORN IN BRADFORD COHORT STUDY.

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Background:

- Maternal perception of their child's weight and concerns about it may influence feeding behaviours, which are known to affect child body weight.
- Studies have found that parents are likely to misperceive their child's weight, especially at young ages.

Research Aim:

1. Describe maternal perception and accuracy of child's weight, and mothers' concerns about their child becoming underweight or overweight at 6 and 24 months after birth in the BiB1000 subsample of the multi-ethnic cohort study Born in Bradford.

Determine predictors of accuracy and concerns at both time periods

Methods

Descriptive statistics for maternal perceptions and accuracy regarding their child's weight. Predictors of mothers' concerns and accuracy were identified with multinomial logistic regression models.

Results

The sample of 670 White British and 846 Pakistani mother child dyads showed that 38.2% and 36.07% of the women misperceived their infant and young child's weight at 6 and 24 months respectively. Women were concerned about their child becoming underweight, whereas a smaller proportion was concerned about overweight. Significant predictors of maternal misperception included child's nutritional status, but this was not a predictor for maternal concerns.

Conclusions

There is substantial misperception of child's weight among women with underweight and overweight children, which is not aligned with their levels of concern about their child's weight. Identification of the relation of mother's perceptions and concerns to child's BMI z-scores at 3 years old and maternal feeding behaviours of the BiB1000 sub-sample is required to help bridge current gaps needed for obesity prevention.

Oral Presentations Session 3: Diet, Nutrition and Growth

FETAL GROWTH IN THE ELFE BIRTH COHORT

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Background and Aims

Both restricted and excessive in utero fetal growth are associated with health outcomes. Having references tailored to the population is essential for identifying and monitoring at-risk pregnancies. Recently, the Intergrowth International Fetal and Newborn Growth Consortium (IG-21) published new fetal growth standards, which could replace the fetal growth references of the French College of Ultrasound's (CFEF). The objective was to investigate whether the IG-21 standards are appropriate for fetal growth monitoring in France.

Methods

We analyzed data from 14,607 singleton pregnancies from the Elfe birth-cohort with at least one measure of femur length, biparietal diameter or abdominal circumference (AC). We modeled the growth of these measures using polynomial regression models and graphically compared percentiles by gestational age with the CFEF and IG-21 curves. Prevalences of births with measures under the 3rd and the 10th percentiles and over the 90th and the 97th percentiles were calculated. Analyses were replicated after selecting only women fulfilling the IG-21 selection criteria.

Results

Elfe percentile curves were closer to the CFEF references than the IG-21 standards. These discrepancies affected the prevalence estimates (e.g. 3% had AC measures under the 10th percentile and 23% over the 90th percentile of the IG-21 curves), and persisted after application of the IG-21 selection criteria.

Conclusions

We observed important discrepancies between fetal growth of Elfe children and the IG-21 standards that were not explained by their stringent selection criteria, suggesting important potential consequences on the screening of abnormal fetal growth if their use was generalized in France.

Oral Presentations Session 3: Diet, Nutrition and Growth

VALIDATION OF THE SCREENING TOOL FOR THE ASSESSMENT OF MALNUTRITION IN PEDIATRICS IN HOSPITAL AND ITS EFFECT ON MEDICAL STAFF'S AWARENESS TO NUTRITIONAL STATUS

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Background and Aims

On admission to the hospital children may suffer from acute or chronic malnutrition. Previously, we evaluated the use of the Screening Tool for the Assessment of Malnutrition in Pediatrics (STAMP) among hospitalized children and compared its performance between nurses and dietitian. In this study we further explored the performance of STAMP and assessed the effect of the tool on medical staff's awareness to nutritional status.

Methods

Area under the ROC curve (AUROC) was used in order to evaluate the validity of the STAMP. STAMP performed by nurses at admission was compared with nutritional assessment performed by a dietitian. In order to assess the effect of the use of STAMP on medical staff's awareness, information regarding nutritional status was compared prior and post the intervention period. Information included anthropometric measurements, biochemical laboratory results and data on referral to a dietitian.

Results

Sixty children were included in the analysis (38 boys, 63%). Mean age was 7.8±4.7y. Prevalence of acute (BMI<-2 SDS) and chronic (height for age<-2SDS) malnutrition was 8%. Sensitivity, specificity, positive and negative predictive values were 95.7%(95% C.I.:85.75-98.83%), 76.9%(95% C.I.:49.74-91.82%), 93.7 and 83.3 respectively. AUROC(0.86,95% C.I.:0.72-1). There was no difference in medical staff's awareness to malnutrition before and after the intervention period.

Conclusions

In this study, the STAMP screening tool performed by a nurse at admission, showed good agreement with full dietitian' nutritional assessment. Thus, STAMP may be used for the identifying risk for malnutrition in hospitalized children. However the use of the tool doesn't influence medical staff's awareness to the nutritional status of admitted patients.

Oral Presentations Session 3: Diet, Nutrition and Growth

EFFECTS OF PROMOTING LONGER-TERM AND EXCLUSIVE BREASTFEEDING ON ADOLESCENT BLOOD PRESSURE, ADIPOSITY, ECZEMA, VISUAL AND NEUROCOGNITIVE OUTCOMES: EVIDENCE FROM THE PROBIT CLUSTER-RANDOMIZED TRIAL

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Background and Aims

Evidence on the long-term effects of breastfeeding on health and development is based almost exclusively on potentially confounded and biased observational studies. Our aim was to evaluate the effects of a randomised breastfeeding promotion intervention on blood pressure, adiposity, eczema, vision and neurocognitive function at 16 years of age.

Methods

Cluster-randomized controlled trial in Belarusian maternity hospitals and their affiliated polyclinics, randomized 1996-1997 into intervention (n=15) or usual practice (n=15) arms. Participants were 17,046 breastfeeding mother-infant pairs, of whom 13,557 (79.5%) were followed up at 16. The intervention was breastfeeding promotion, modeled on the World Health Organization/United Nations Children's Fund Baby-Friendly Hospital Initiative. The primary analysis was based on modified intention-to-treat, ITT (i.e. without imputation for loss to follow-up), accounting for within-clinic clustering.

Results

In the ITT analyses, we observed a 54% lower odds of flexural eczema on skin examination in the intervention compared to the control group (cluster-adjusted OR = 0.46, 95% CI 0.25, 0.86). Children in the intervention group had slightly and non-significantly higher neurocognitive scores. Cluster-adjusted means were 1.0 (95% CI: -1.0 to 3.1) points higher in the intervention group for global score; 1.5 (95% CI: -0.04 to 3.0) points higher for verbal function; and 1.2 (95% CI: -0.1 to 2.4) points higher for memory. There was no evidence of a beneficial effect of the intervention on adiposity, blood pressure or visual outcomes.

Conclusions

We found beneficial effects of postnatal breastfeeding promotion on atopic eczema risk and on neurocognitive function, particularly verbal function, at age 16.

Oral Presentations Session 3: Diet, Nutrition and Growth

SYSTEMATIC REVIEW ON N-3 AND N-6 PUFA INTAKE AND RECOMMENDATIONS IN LACTATING WOMEN, PREGNANT WOMEN AND INFANTS

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Background and Aims

Earlier reviews have indicated that on average less polyunsaturated fatty acids (PUFAs) are consumed than recommended by the FAO/WHO. We present the results of a systematic review that (1) investigates the current dietary intakes of total and specific n-3 and n-6 polyunsaturated fatty acids (PUFAs) in European infants, pregnant and lactating woman; (2) identifies the latest PUFA intake recommendations and their scientific criteria; (3) highlights gaps between current intakes and recommendations.

Methods

The systematic review was performed according to PROSPERO guidelines (http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014014717). This is the work from an ILSI Europe expert group which addresses multiple issues around n-3 and n-6 PUFAs.

Results

17 studies performed in different European countries reported intake of total n-3 and n-6 PUFAs and/or individual n-3 or n-6 PUFAs in at least one of the population groups: 10 in pregnant women, 4 in lactating women and 3 in infants (6-12 mo). Mean linoleic acid intake was below the recommendation (4E%) in lactating women. Mean α -linolenic acid intake was in line with the recommendation (0.5E%) in these subgroups. In 69% of the countries, mean eicosapentaenoic acid and/or docosahexaenoic acid intake was lower than recommended.

Conclusions

The available data indicate that mean intake of eicosapentaenoic acid and docosahexaenoic acid and to a lesser extent of linoleic acid may be suboptimal compared to EFSA recommendations for a significant part of lactating/pregnant women and infants. More nationally representative surveys and data on relevant individual PUFAs are required to clarify the need for specific public health measures to optimise PUFA intake in Europe.

Oral Presentations Session 3: Diet, Nutrition and Growth

PHYSIOLOGIC AND BEHAVIORAL BASES FOR LOWER BREASTMILK SUPPLY IN OBESE WOMEN: PREGNANCY GLYCEMIA, PROLACTIN RESPONSE, AND INFANT POSITIONING

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Background and Aims

Obese women experience shorter breastfeeding duration than normal weight women and report insufficient milk production as the primary reason, but mechanisms responsible for this phenomenon are not well established. Our objective was to test the association of pre-pregnancy BMI with breastmilk output in exclusively breastfeeding women, and to explore possible physiological and behavioral mechanisms.

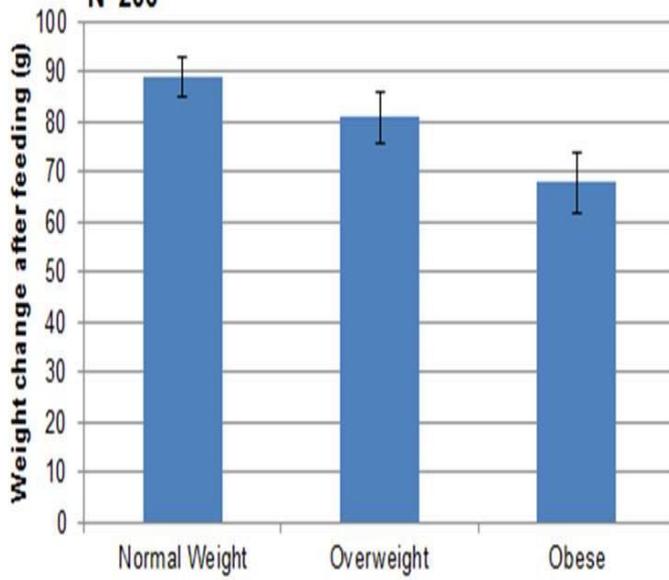
Methods

Subjects in the main study included exclusively breastfeeding, non-diabetic, non-smoking mothers and their term, AGA, singleton infants (N=206 dyads). Milk output was measured at 1 and 3 months post-partum as weight change from pre to post feeding after a single morning feed. Maternal pre-pregnancy BMI and oral glucose challenge (50g) test results (OGC) were obtained from the electronic health record and examined as predictors of milk output in linear regression models, adjusting for potential confounders. An in-depth study of 51 exclusively breastfeeding women (N=51) examined maternal blood prolactin levels at 48 hours, and mother-infant breastfeeding positioning and milk output at 7 days post-partum.

Results

There was a negative association between milk output and pre-pregnancy BMI at 1 month ($p=0.015$), and with OGC at 3 months ($p=0.0008$). These associations were further supported by our findings of significantly lower serum prolactin level and poorer mother-infant positioning score in obese than normal and overweight women, both of which were associated with lower milk output at 7 days post-partum (all $p<0.05$).

Figure 1. Milk output (g) at 1 month post-partum by maternal BMI, covariate adjusted (p=0.015), N=206



Conclusions

Both physiological and behavioral factors appear to link maternal obesity with lower milk supply. Appropriate lactation support for obese women is critical to increase breastfeeding rates.

Oral Presentations Session 3: Diet, Nutrition and Growth

LEPTIN DIRECTLY STIMULATES AROMATASE EXPRESSION IN ATDC-5 CELL LINE

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Background and Aims

Malnutrition is the most common cause of short stature. Usually when food intake is corrected spontaneous catch-up growth (CUG) occurs, however, sometimes CUG is incomplete; leading to permanent growth deficit.

The aim of this study was to investigate the mechanisms that limit the efficiency of CUG. Specifically, we studied the cross talk between leptin, increased by re-feeding, and sex hormones, increased with age; can the rapid increase in leptin potentiates the inhibitory effect of sex hormones on linear growth.

Methods

ATDC5 cells (early proliferative stage) were serum starved (24h) and incubated with 100ng/ml leptin; mRNA and protein analysis were performed by qPCR and western blot respectively.

The level of aromatase (aromatizing testosterone to estrogen), estrogen receptors (ER) (alpha and beta) were all increased by serum starvation. Leptin further increased the expression and protein level of all three with a different time course.

Results

Food restriction reduces growth plate (EGP) height and leptin levels in a reversible manner. Re-feeding increases leptin, which is involved in growth resumption. We have shown that *in vitro*, serum starvation as well as leptin increase the level of aromatase and ERs. These results may indicate that when re-feeding occurs during puberty, it will lead to increased estrogen level and activity, and irreversible shrinkage of the EGP.

Conclusions

Our results suggest a crosstalk between leptin, estrogen receptors and aromatase in linear growth regulation. These results may have significant implications in the understanding of the mechanisms that limit CUG and may pave the way for new strategies in treatment of short stature.

Oral Presentations Session 3: Diet, Nutrition and Growth

KLOTHO, THE ANTI-AGING PROTEIN IS EXPRESSED IN YOUNG RAT GROWTH PLATE, CAN IT BE A NEW TARGET FOR GROWTH MODULATION?

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Background and Aims

Life span in rodents can be increased by food restriction (FR) or over expression of Klotho (Kl), the aging-suppressor gene. Klotho has been associated with many physiological activities that may be associated with linear growth, including glucose, calcium and phosphate metabolism and FGF 23 and insulin-like growth factor-1 (IGF-1) pathways. However its role in linear growth has not been studied.

In this study we aimed to investigate the expression of klotho in rat epiphyseal growth plates (EGP) and to follow the effect of ageing and FR, both known to lead to growth attenuation on its level and localization.

Methods

EGP taken from male SD rats (ages 24, 35, 41, 62 & 84 days) fed ad-libitum or from FR 35 old rats were measured. Klotho level and localization was studied by Immunohistochemistry. IGF-1 was measured with Elisa

Results

Klotho was identified in EGP of young (24d) rats in the resting, proliferative and pre-hypertrophic zones; with less intense staining in hypertrophic chondrocytes. Loss of staining in the proliferative zone was observed in 35d old rats; almost no klotho could be detected in rats of 41 day old or older. In FR rats, in spite of similarly reduced EGP height, the level and localization of klotho was similar to the control. IGF-I was reduced both by aging and FR.

Conclusions

To conclude: Klotho is expressed in all zones of the EGP and its level is reduced by ageing but not by FR.

Oral Presentations Session 4: Childhood and Adolescence I

MOTHERS' INTAKE OF SUGAR-CONTAINING BEVERAGES DURING PREGNANCY AND BODY COMPOSITION OF THEIR CHILDREN DURING CHILDHOOD: THE GENERATION R STUDY

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Background and Aims

High intake of sugar-containing beverages (SCBs) has been linked to increased risk of obesity. However, associations of SCB intake during pregnancy with child's growth and body composition is unclear. Therefore, we explored whether mothers' SCB intake was associated with children's body mass index (BMI) up to 6 years with detailed measures of body composition at 6 years. Additionally, we examined different types of SCBs: fruit juice, soda and syrup.

Methods

We included 3,312 mother-child pairs of the Generation R Study, a prospective cohort from fetal life onward in Rotterdam. Energy-adjusted SCB intake was assessed in the first trimester using a food-frequency questionnaire. Child's anthropometric data were collected repeatedly up to the age of 6 years and BMI was calculated. At their age of 6 years, we additionally measured fat mass index (FMI) and fat-free mass index (FFMI) using dual-energy X-ray absorptiometry. All outcomes for children were standardized for sex and age.

Results

Results from linear mixed models showed that, after adjustment for confounders, mothers' total SCB intake was positively associated with children's BMI up to age of 6 years (0.04 SDS per serving/day (95% CI 0.00, 0.07)). Furthermore, intake of total SCB and fruit juice, but not of soda or syrup, was associated with a higher FMI (total SCB: 0.05 SDS (95%CI 0.01, 0.08); fruit juice: 0.04 SDS (95% CI 0.01, 0.06)) of the 6-year-old children.

Conclusions

Our study suggests that maternal SCB intake is positively associated with children's BMI during early childhood, possibly driven by a higher fat mass of the children.

Oral Presentations Session 4: Childhood and Adolescence I

MATERNAL GESTATIONAL DIABETES AFFECTS OFFSPRING NEURODEVELOPMENT AT 3.5 YEARS OLD. A FOLLOW-UP FROM THE PREOBE COHORT

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Background and Aims

We aimed to investigate the long-term influence of maternal obesity and gestational diabetes (GD) during pregnancy on offspring neurodevelopment up to 3.5 years.

Methods

161 children participating in the PREOBE study, born to overweight (n=31), obese (n=27), GD (n=49), or normal weight pregnant women (n=54) were studied. Infants' neuropsychological development was assessed by Cumanin and K-abc neuropsychological tests. ANOVA, MANCOVA and Logistic regression model (*enter*) were performed using SPSS version 20, and adjusted for confounding factors (*maternal age, weight gain during pregnancy, maternal education, placenta weight and infant type of feeding*).

Results

Offspring of GD mothers showed 3.4 times less probability to be above percentile (PC) 25 and PC50 than those born to normal weight mothers in *Rhythm centile score*: (OR:3.385, p=0.040), and 4.4 times less in *Non-verbal development centile score*: (OR:4.393, p=0.022) (adjusted). Children born to GD mothers have lower *Riddles typical score* in respect to those born to overweight mothers (p=0.041-unadjusted & p=0.013-adjusted). Offspring of GD mothers showed 8.4 times less probability to be above PC75 in *Knowledge sum score*: (OR:8.429, p=0.020), and 5.3 times less in *Knowledge typical score*: (OR:5.332, p=0.037), respect to those born to healthy normal weight women (*adjusted*).

Conclusions

GD exerts a significant long-term effect on children cognitive development up to 3.5 years old. The present observation prompts further confirmative studies to explore possible long-term effects of maternal GD on children neurodevelopment, to better understand the mechanisms involved in these programming effects of the brain and the potential preventive interventions.

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Oral Presentations Session 4: Childhood and Adolescence I

PREVALENCE AND FACTORS ASSOCIATED WITH UNDERWEIGHT AMONG USA CHILDREN LESS THAN 6 YEARS-OLD BASED ON NHANES DATA FOR CYCLES 1999-2000 AND 2013-2014.

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Background and Aims

Undernutrition is associated with growth faltering and increased morbidity and mortality in low-medium income countries. However, little is known about the prevalence of undernutrition and its associated factors in high income countries like the USA. This study was designed to assess the prevalence of underweight (< 5th percentile weight-for-height/length (WH)) and its associated factors (demographic, socioeconomic and nutrition) in comparison to the “risk of underweight” (5-25th percentile WH) and “normal weight” (>25-50th percentile WH).

Methods

We used data from the National Health and Nutrition Examination Survey (NHANES) for 1999-2000 and 2013-2014 cycles. NHANES is a stratified, multistage probability sample of the civilian, noninstitutionalized population of the USA. The analyses were restricted to the < 50th centile of WH for each cycle to reduce the effects of overweight and obesity on the analyses.

Results

Underweight prevalence for 1999-2000 (N=1384) was 4%, and for 2013-2014 (N=1431) was 3%. For 1999-2000, non-Hispanic-whites comprised a third of the <5th percentile children while it represented roughly two-thirds of those in higher percentile (p=0.0015). For 2013-2014, the percentage of children who were ever breastfed increased with increasing WH percentiles (p=0.0247). Family poverty was directionally higher and child food security appeared to have decreased from 1999-2000 to 2013-2014 in the <5th percentile children, while there was a slight decreased intakes of energy and protein in the latest cycle.

Conclusions

The prevalence of underweight remained constant in the two cycles, and it seems conditioned by the quality of nutrition rather than the quantity as others have observed.

Oral Presentations Session 4: Childhood and Adolescence I

NUTRITIONAL STATUS, BLOOD PRESSURE AND METABOLIC PROFILE IN CHILDREN WITH HIGH BIRTHWEIGHT

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Background and Aims

To evaluate the effects of high birth weight and risk for obesity, hypertension and metabolic changes in children/adolescents aged 6 to 12 years of age.

Methods

A cross-sectional study with children, enrolled in a public school in the metropolitan region of São Paulo. Anthropometric data, family history and blood pressure levels were obtained from 719 children and 518 collected laboratory. The variables of risk for CVD were waist circumference, blood pressure (SBP/DBP), body mass index (BMI), lipid profile, blood glucose, insulin and insulin resistance (HOMA). The birth weight was classified into 3 groups: low birth weight (LBW<2,500g), appropriate weight (AW: 2,500g<BW<4000g) and high birth weight (HBW>4000g).

Results

In 719 children evaluated, the mean age was 9.5±2.0 years and 371 (51.6%) were male. There was no statistically significant difference in relation to the classification of nutritional status and birth weight. The mean values of ZIMC, waist/height and ZE were higher in children with HBW, however, without statistically significant differences in relation to other groups. Children/adolescents with HBW showed no worse lipid or glucose and insulin resistance. The group with low birth weight showed the highest percentage of unsuitability for SBP, DBP and triglycerides compared to groups with AW and HBW, even after adjustment for sex.

Conclusions

No associations were found between being born with high weight and obesity, blood pressure levels, changes in lipid profile and insulin resistance in children and adolescents.

Oral Presentations Session 4: Childhood and Adolescence I

A COMPLETE AND BALANCED CHILD NUTRITION SUPPLEMENT SUPPORTS HEALTHY BODY COMPOSITION DURING CATCH-UP GROWTH

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Background and Aims

Poor nutrition in childhood is associated with growth faltering and increased risks of chronic diseases. Administration of oral nutritional supplement (ONS) with macro- and micronutrients has been shown to promote catch-up growth in both weight and height, thereby helping to ameliorate growth faltering in young children.

The aim of the present study was to assess the quality of catchup growth induced by ONS, in animal model of growth restriction due to under nutrition, through evaluation of lean body mass (LBM) and fat mass (FM).

Methods

Young SD rats were food restricted at 70% of normal caloric intake for 4 weeks; and re-fed at 120% of normal caloric intake for 4 weeks. Refeeding diet had 50% calories from animal diet and 50% from ONS formulated for optimal growth. After refeeding, the quantity and quality of catch-up growth were measured including weight, length, LBM and FM.

Results

During nutrient restriction, body weight and length of animals was reduced compared to healthy controls. Both LBM and FM were significantly lower than healthy controls ($p < 0.001$). Refeeding with ONS resulted in increase of weight and length, with significant catch-up growth compared to baseline ($p < 0.001$). Detailed examination of body composition showed that the catch-up in body weight was due to proportionate increase of LBM and FM, resulting in a final body composition similar to healthy controls.

Conclusions

This data supports the use of well-designed ONS for recovery from growth restriction due to under nutrition, and return to normal growth trajectory characterized by normal ratio of lean mass and fat mass.

Oral Presentations Session 4: Childhood and Adolescence I

IMPROVED COMPLIANCE, NUTRITIONAL INTAKES AND GROWTH WITH A HIGH ENERGY DENSITY, LOW VOLUME PAEDIATRIC ORAL NUTRITIONAL SUPPLEMENT

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Background and Aims

Children with disease-related growth failure often have increased nutritional requirements, coupled with poor appetite and insufficient food intake. Oral nutritional supplements (ONS) are often used to manage such patients but compliance is variable. In adults, more energy-dense, low volume ONS improve compliance and nutrient intakes^{1,2}, but their effectiveness in children has not been explored. This study investigated the efficacy of high energy density (2.4kcal/ml), low volume (125ml) (EDLV), multi-nutrient paediatric ONS versus standard paediatric ONS (1.5kcal/ml, 200ml) in children requiring nutritional support.

Methods

38 children with growth failure (age 6y (1-13y), weight 17.52kg (SD7.55)) were randomized to EDLV-ONS (Fortini Compact Multi Fibre, Nutricia; 300kcal/125ml, n=21) or standard ONS (various; 300kcal/200ml, n=17) in addition to diet for 4weeks. Outcome measures were total nutrient intake, daily compliance (% consuming $\geq 75\%$ prescribed volume), weight (kg, z-score) and height (cm, z-score).

Results

Total energy intake (1843kcal/d (SD673) vs 1272 kcal/d (SD562), $p=0.008$), protein intake (59.6g/d (SD23) vs 39.8g/d (SD19), $p=0.007$) and compliance (81% vs 59%, $p=0.005$) were significantly greater with EDLV-ONS than standard ONS. Total fluid intakes were not significantly different between groups (1024ml/d (SD409) vs 860ml/d (SD449)). Weight and height improved in both groups (significant difference between groups for height at week 4 (+15.07cm (SD6.77), $p=0.03$).

Conclusions

High energy-density, low volume paediatric ONS significantly improve compliance and nutritional intakes over standard paediatric ONS, and improve growth in children requiring nutrition support. Further research is warranted to examine the clinical benefits of these feeds.

¹Hubbard et al 2010. Proc Nut Soc.

²Hubbard et al 2012. Clinical Nutrition.

Oral Presentations Session 4: Childhood and Adolescence I

WHOLE-GRAIN INTAKE, MAINLY FROM OATS, IS NEGATIVELY ASSOCIATED WITH BLOOD PRESSURE AND INSULIN BUT NOT WITH BODY FATNESS IN 8-11 YEAR-OLD DANISH CHILDREN

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Background and Aims

Wholegrain consumption has been shown to be cardioprotective in adults, but evidence in children is limited. This cross-sectional study explored whether intake of whole-grain and dietary fiber were associated with body fatness and cardiometabolic risk profile in 742 Danish 8-11-year-olds.

Methods

We collected data on parental education, puberty, dietary intake by 7-day records, physical activity by accelerometry and measured anthropometry, fat mass index by DXA, and blood pressure. Fasting blood samples were analyzed for alkylresorcinols, a biomarker of wholegrain wheat and rye intake, as well as HDL and LDL cholesterol, triacylglycerol, insulin, and glucose.

Results

Median (IQR) intakes of wholegrain and dietary fiber were 69 (48-94) g/10MJ and 24 (20-31) g/10 MJ, respectively. Thirteen% of the children were overweight/obese, and most had low risk cardiometabolic profiles. In multivariate-adjusted analyses dietary wholegrain, fiber intake, and plasma alkylresorcinols were not associated with fat mass index. However, whole-grain and fiber intake were inversely associated with systolic blood pressure ($P < 0.05$) and insulin ($P < 0.01$) e.g. with 0.2 (95% CI -0.3; -0.0) mmHg lower blood pressure per g/MJ wholegrain. Further adjustment for fat mass index did not change the associations. Additional analyses revealed that associations between wholegrain intake and blood pressure as well as insulin were mainly driven by wholegrain oat, not wheat or rye, and alkylresorcinol data supported this.

Conclusions

Higher intakes of wholegrain, mainly oat, and dietary fiber were associated with lower blood pressure and insulin independently of body fatness in Danish 8-11-year-olds. The potential underlying causality needs investigation in randomized controlled trials.

Oral Presentations Session 4: Childhood and Adolescence I

DIET QUALITY IN EARLY AND MID-CHILDHOOD IN RELATION TO GROWTH AND BODY COMPOSITION UP TO THE AGE OF 9 YEARS

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Background and Aims

Associations of overall diet quality in infancy and childhood with body composition in later childhood remain unclear. We aimed to examine associations of diet quality in early and mid-childhood with growth and body composition up to the age of 9 years.

Methods

We included 3,991 children participating in the Generation R Study, a population-based cohort. Dietary intake at the ages of 1 and 8 years were assessed with food-frequency questionnaires and diet quality scores were calculated, reflecting adherence to dietary guidelines (e.g. sufficient intake of vegetables, fruit, whole-grains, dairy, etc.). We measured weight, height, and body composition with dual-energy X-ray absorptiometry up to the age of 9 years. With these data, we calculated body mass index (BMI), fat mass index (FMI), and fat-free mass index (FFMI).

Results

After adjustment for sociodemographic and lifestyle factors, children with a higher diet quality at age 1 year had a higher height, weight, and FFMI at age 9 years (Table 1). This association was independent of later diet quality. Also a higher diet quality at age 8 years was associated with a higher height, weight, and FFMI, but not with FMI, at age 9 years, independent of diet quality in infancy.

Table 1. Associations of diet quality in early and mid-childhood with child's growth and body composition at the age of 9 years

	Weight (SDS) B (95%CI)	Height (SDS) B (95%CI)	Body mass index (SDS) B (95%CI)	Fat mass index (SDS) B (95%CI)	Fat-free mass index (SDS) B (95%CI)
Diet Quality Score at age 1 year					
n = 2,244	0.06 (0.02, 0.09)	0.07 (0.03, 0.11)	0.03 (-0.00, 0.07)	0.03 (-0.00, 0.06)	0.06 (0.03, 0.10)
Diet Quality Score at age 8 years					
n = 3,991	0.03 (0.01, 0.06)	0.04 (0.02, 0.07)	0.02 (-0.00, 0.04)	0.00 (-0.02, 0.02)	0.06 (0.04, 0.08)

Values are regression coefficients (B) with 95% confidence intervals (CI) from linear regression analyses and reflect associations of diet quality scores (0 to 10 with higher scores reflecting higher diet quality) at age 1 or 8 years, with age- and sex adjusted growth and body composition outcomes at age 9 years (SDS). Analyses were adjusted for: gender, age at outcome measurement, total energy intake, ethnicity, sports, screen time, BMI mother, education mother, household income, smoking mother, parity, breastfeeding, folic acid supplement use and alcohol intake during pregnancy, and for diet quality at the other time point.

Conclusions

Our results suggest that a higher diet quality in early and mid-childhood are both associated with a higher height, weight and fat-free mass, but not with fat mass, in later childhood. These findings emphasize the importance of diet quality for healthy growth in children.

Oral Presentations Session 4: Childhood and Adolescence I

ROLE OF EARLY LIFE FACTORS IN ETHNIC DIFFERENCES IN GROWTH TRAJECTORIES FROM 3 TO 11 YEARS

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Background and Aims

There is evidence to suggest that Black children are taller and South Asian children are shorter than White children in the UK. Less is known about their growth patterns. We aimed to investigate how growth trajectories in height differed by ethnic groups and the potential explanatory role of parental height, prenatal factors (parity, maternal smoking and age at pregnancy), birthweight, and parents' socio-economic position (SEP) in a contemporary UK cohort.

Methods

We used data from the Millennium Cohort Study ($N \sim 16,000$). Mixed effects cubic growth models were applied to height measurements at ages ~3y, 5y, 7y, and 11y to examine ethnic differences (White, Black, South Asian) in height trajectories, and changes in these differences after adjusting for potential explanatory factors.

Results

Compared to their White counterparts, minority ethnic children were taller by 3y (range from 0.4cm to 3.1cm). Black children grew faster (by 2-3cm/y) to age 11y, while South Asian girls grew slightly slower (-0.12cm/y). Parental height widened ethnic differences in height at 3y and explained little of the difference in growth rate between Black and White children. Adjusting for prenatal factors, birthweight and SEP further increased height differences at 3y, e.g., from 1.9cm to 2.3cm between South Asian and White girls, and made no substantial changes to the differences in growth rate.

Conclusions

Taller stature in Black and South Asian (compared to White) children was already established by 3y. Black children grew faster thereafter to 11y. Differences observed were not explained by parental height and early life factors.

Oral Presentations Session 5: Infancy I

INFLUENCE OF INFANT FEEDING ON LONGITUDINAL BRAIN DEVELOPMENT AND COGNITIVE GROWTH

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Background and Aims

Background: Throughout infancy, the brain evolves alongside emerging cognitive skills and abilities, and in response to environmental influences including early life nutrition. Prior studies comparing breast and formula-feeding suggest differential brain structure, and associated differences in cognitive scores. However, no study has examined longitudinal development of brain structure and cognitive growth in children differentiated by infant feeding choice. We sought to compare longitudinal brain and cognitive growth trajectories in a large, matched sample of children 3 months to 4 years of age.

Methods

Methods: Magnetic resonance imaging data were acquired of 88 formula and 62 exclusively breast-fed (for at least 90 days) infants matched for age ($p=0.24$), gestation ($p=0.39$), birth weight ($p=0.52$), gender ($p=0.85$), parent marital status ($p=0.66$) and parent education ($p=0.9$). 231 longitudinal datasets were obtained on the breastfed children, and 221 on the formula-fed children, at ~6 month increments. The Mullen Scales of Early Learning were used to assess overall cognitive, verbal, and non-verbal abilities. Mixed modeling was used to investigate group differences in brain and cognitive development trends.

Results

Results: Different types of infant feeding resulted in overall brain development and some cognitive ability differences across the first 4 years of life, with significant differences in both rate of change and overall measures.

Conclusions

Conclusion: Our longitudinal findings indicate differences in brain and cognitive development associated with infant feeding. They further suggest that they persist into childhood, potentially predicting changes seen in adolescents and adults.

Oral Presentations Session 5: Infancy I

TYPE OF FORMULA IN THE BOTTLE IMPACTS EARLY WEIGHT GAIN AND GROWTH: A RANDOMIZED CONTROLLED TRIAL

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Background and Aims

Millions of infants feed breast milk substitutes, most often a cow milk formula (CMF), and they are at greater risks for later obesity. However, the type of formula in the bottle can impact weight gain and satiation. We conducted a randomized clinical trial that measured growth and energy balance from 0.5-12.5 months in two groups stratified for sex and race; one group fed CMF and the other an isocaloric but extensively hydrolyzed formula (EHF).

Methods

Infants were weighed and measured monthly and anthropometric measures normalized to Z-scores. From these data, we determined weight gain velocity, as defined as change of weight divided by change of age in days, and the incidence of rapid weight gain as defined as an increase in WLZ standard deviations >0.67 between the ages of 0.5 and 4.5 months.

Results

While there were no differences in LAZ, infants randomized to CMF had significantly higher WLZ, WAZ and BMIZ than EHF infants. These group differences began two weeks after randomization and persisted for 11 months, even when solid foods were complementing the formula diet. During the first 4.5 months of life, feeding CMF resulted in weight gain velocities 3.1g/day higher than feeding EHF and almost tripled the incidence of rapid weight gain.

Conclusions

The clinical and societal impact is significant: millions of infants globally feed breast milk substitutes, and early rapid weight gain increases risks for later disease including obesity. *Supported by NIH grant R01HD072307.*

Oral Presentations Session 5: Infancy I

A RANDOMIZED CLINICAL TRIAL: INFANT FORMULA COMPOSITION IMPACTS ENERGY BALANCE

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Background and Aims

Compositional differences in infant formulas can impact weight gain patterns, but the energy balance mechanisms remain unknown. In a randomized clinical trial, we confirmed that infants randomized to cow milk formula (CMF) had accelerated weight gain compared to those fed an extensive protein hydrolysate formula (EHF); we also measured all components of energy balance in infants fed these formulas.

Methods

Healthy infants (N=113) were randomized at 0.75 months to either CMF or EHF for one year. Each month, energy intake (EI) was assessed by a 1-day diet record. At 0.75, 3.5, 12.5 months, EI was determined by 3-day pre/post bottle weights; sleeping energy expenditure (SEE) by indirect calorimetry; total energy expenditure (TEE) by doubly labeled water; fecal energy loss (EL_f) by bomb calorimetry.

Results

EHF-fed infants had a lower weight gain in the first 4.5 months of the study. EL_f was greater in EHF-fed infants within days of consuming the study formula (0.75 months), but not at 3.5 or 12.5 months. EI (mL/feeding, kcal/day, kcal/kg body weight/day) was lower in EHF versus CMF-fed infants in the first several months of the study. Neither SEE nor TEE differed between formula groups.

Conclusions

Formula-fed infants are not a homogenous group. CMF and EHF are isocaloric, but differ in the form of protein (intact versus extensively hydrolyzed). EHF-fed infants demonstrated lower early weight gain due to decreased EI and an initial increased EL_f, compared to CMF-fed infants, but not due to differences in energy expenditure.

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Oral Presentations Session 5: Infancy I

FEEDING PRACTICES AND IGE SENSITIVITY AT AGE 6 YEARS– RESULTS FROM A LONGITUDINAL NUTRITION COHORT

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Background and Aims

Dietary factors may be important for food sensitization in early life. Our aim was to study diet in infancy and at 6-years in children IgE-sensitized to common food allergens and compare to their non-sensitized peers, using data from our national nutrition cohort born 2005.

Methods

Dietary data on the first 4 months of life was obtained using food history. At ages 9 and 12 months and at 6 years, 3-day weighed food records were kept. At 6 years blood samples (n=144) were analyzed for serum IgE to six food items. Children with IgE ≥ 0.35 kU/L were considered IgE-sensitized.

Results

Fourteen children (10%) were IgE-sensitized at 6 years. Their background characteristics did not differ from their non-sensitized peers, nor did the duration of exclusive or any breastfeeding. Compared to non-sensitized children, IgE-sensitized children were more likely to have received solid foods prior to age 4 months (57% vs. 23%, $p=0.006$), consumed less Icelandic fresh milk follow-on formula at 12 months (presented as median (25th; 75th percentile): 0 ml (0; 157) vs. 137 ml (0; 293), $p=0.043$) and more regular cow's milk 74 ml (23; 390) vs. 12 ml (0; 63), $p=0.002$). At 6 years IgE-sensitized children were also less likely to use vitamin D supplements (23% vs. 56%, $p=0.026$).

Conclusions

Our results are in line with current recommendations of delaying introduction of solids beyond the first 4 months of life and using Icelandic fresh milk follow-on formula until 12 months of age. Our findings on vitamin D supplement merit further research.

Oral Presentations Session 5: Infancy I

GROWTH TRAJECTORIES IN EARLY INFANCY AND STUNTING AT 2 YEARS IN NEPALESE CHILDREN

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Background and Aims

Few longitudinal studies have investigated the relationship between early growth faltering and later stunting risk in low and middle income countries. We assess the association between growth trajectories in early infancy (0-6 months) and stunting at 2 years.

Methods

We analysed data from a cohort of 375 Nepalese children. Participants were enrolled at birth and length measurements were obtained at 3, 6, and 24 months. To assess the children's growth trajectories, conditional growth was calculated as the deviation from the expected length based on the preceding length measurement, predicted using the pattern of growth in the population. We obtained conditional growth for the two periods 0-3 and 3-6 months. Children with positive values were classified as having grown well, children with negative values as having experienced growth faltering. We modelled the association between four categories of growth trajectories and being stunted at 2 years. We used visualization techniques to represent these links.

Results

At 2 years, children who had faltered twice had the highest prevalence of stunting (67%), followed by those only faltering 0-3 months (59%), only faltering 3-6 months (53%), and lowest in those without faltering (33%). For children who had experienced growth faltering both 0-3 and 3-6 months the odds of being stunted at 2 years was 2.0 compared to only 0.5 for those who grew normally in these periods ($p < 0.001$).

Conclusions

Growth faltering in early infancy is associated with higher risks of stunting at 2 years. It is likely that the risks differ by timing of faltering.

Oral Presentations Session 5: Infancy I

EFFECTS OF BREASTFEEDING RELAXATION THERAPY ON BREAST MILK COMPOSITION IN A RANDOMISED TRIAL

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Background and Aims

Previous studies among mothers of preterm infants reported a significant increase in breast milk fat in those who listened to relaxation therapy during breastfeeding. No studies have investigated the effects of relaxation therapy on other milk macronutrients or the change in milk energy within a feed; and none have included mothers of full-term infants. **Objective:** To determine the effectiveness of a relaxation tape on breast milk macronutrient content and the change of milk energy within a feed among mothers of full-term infants.

Methods

Primiparous pregnant women, recruited from antenatal clinics in Klang-Valley, Malaysia, were randomised postnatally into control (n=31) and intervention (n=33) (audio-relaxation recording) groups. Home visits were performed at 2-3, 6-8 and 12-14 weeks to collect fore- and hindmilk samples. Breast milk macronutrients were measured using the MIRIS Human Milk Analyser and total milk energy was calculated.

Results

Foremilk fat, protein and carbohydrate at HV1 (baseline) were not significantly different between groups. Relaxation group mothers showed ii) higher foremilk carbohydrate at HV2 (p=0.05) and HV3 (p=0.03); ii) greater overall pooled milk carbohydrate (p=0.02), pooled hindmilk fat (p=0.03) and pooled increase in milk energy within a feed (p=0.04); and iii) a non-significant trend towards greater increase in milk energy and fat content over a feed at all HV.

Conclusions

Repeated listening to the relaxation therapy may have contributed to a significantly higher breast milk carbohydrate content. Mothers who were more relaxed as a result of listening to the relaxation therapy may have had more efficient milk ejection, resulting in higher hindmilk fat.

Oral Presentations Session 5: Infancy I

IMPROVING THE MANAGEMENT OF ACUTE MALNUTRITION IN INFANTS UNDER 6 MONTHS (MAMI): TESTING, REFINING AND UNDERSTANDING A NEW ASSESSMENT AND TREATMENT TOOL

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Background and Aims

The C-MAMI tool (Community management of uncomplicated acute malnutrition in infants <6m) was developed to help identify, assess and manage malnourished and at-risk infants <6m of age. The aim of this research is to test the tool's functionality and adapt it to make it suitable for everyday use on the ground.

Methods

Two checklist adaptations of the C-MAMI tool were developed and piloted with the original whole tool in semi-structured interviews (n=24) with health workers from hospitals, clinics and the community in Malawi. Interviews involved role plays where health workers tested the tool. Observational data was also collected. Key informant interviews (n=5) were carried out to obtain feedback on the checklists from the original developers of the tool. Data was analysed with framework and thematic analysis.

Results

The C-MAMI tool was welcomed by health workers as necessary to fill an existing gap. A checklist version was found to be easier to use and preferred by potential users compared to the entire tool. However, many reported difficulties using any form of the tool for the first time. The anthropometric/nutritional assessment was particularly difficult resulting in various assessment outcomes. Several items on the checklist were interpreted differently. A C-MAMI checklist is presented for use in the field.

Conclusions

The C-MAMI checklist is a viable option for identifying and managing acutely malnourished or at-risk infants <6m. Well-planned training is a prerequisite for successful implementation of the tool. Items in the checklist and tool need to be clarified to avoid misinterpretation and misclassification.

Oral Presentations Session 5: Infancy I

TOWARDS ROLLOUT OF NEW WHO GUIDELINES FOR IMPROVED MANAGEMENT OF SEVERE ACUTE MALNUTRITION IN INFANTS AGED LESS THAN 6 MONTHS: AN AGREE APPRAISAL OF NATIONAL GUIDELINES

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Background and Aims

For the first time, World Health Organization (WHO) Severe Acute Malnutrition (SAM) guidelines include a chapter on infants aged under 6 months (infants<6m). To inform international rollout, we aimed to describe current national guidelines.

Methods

We summarised infant<6m-related content for all available SAM guidelines. We appraised quality using AGREE: an international, standardized appraisal instrument to assess clinical management guidelines.

Results

76%(35/46) of guidelines were from Africa; 70%(32/46); (32/46, 70%) were dated \geq 2010. Pages devoted to infants ranged from 1%-18%, mean 7%. Only one guideline included new WHO recommendations, differentiating complicated (clinically sick) and uncomplicated infant SAM and recommending outpatient treatment for the latter. Other guidelines only described inpatient care. Admission criteria focused on low weight-for-height and treatment aim was to "improve or re-establishing exclusive breastfeeding". Support was for carers widely recognised: 88%(35/45) noting the need for emotional support and reassurance; 62%(30/45) noted the need for adequate food and fluids.

Guidelines' strengths were: clear scope and purpose (AGREE domain 1); professional stakeholder involvement (domain 2); clarity and presentation (domain 4); tools to support applicability (domain 5).

Weaknesses were lack of patient involvement; poor rigour of development (domain 3); poor description of editorial independence (domain 6) .

Conclusions

Current national SAM guidelines have many strengths and already include sections on infants. However, almost all are out-of-step with latest international guidance: this needs to be urgently addressed. Guideline developers can learn from each other's' strengths and weaknesses and use the AGREE framework to help improve future guidelines. This is an important first step towards improved patient management.

Oral Presentations Session 5: Infancy I

MATERNAL AND CHILD DETERMINANTS OF GROWTH TRAJECTORIES FROM BIRTH TO 3.5 YEARS: RESULTS FROM TWO PROSPECTIVE COHORTS OF AUSTRALIAN CHILDREN

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Background and Aims

Knowledge of growth trajectories and their determinants early in life have particular implications for designing future interventions to promote healthy growth. This study aimed to investigate maternal and child determinants of longitudinal growth trajectories in early childhood.

Methods

Secondary analyses of pooled data from the Melbourne Infant Feeding Activity and Nutrition Trial (InFANT) (n=542) and the InFANT Extend study (n=514) were conducted. Children's height and weight were collected at birth, 3, 9, 18 months, and 3/3.5 years months. Body mass index and height for-age z-scores (BMIz, HAZ) were computed using WHO growth charts. Mixed effect fractional polynomial models were fitted to examine determinants of BMIz and HAZ trajectories.

Results

Children of overweight or obese mothers had higher mean BMIz and HAZ at all ages from birth to 3.5 years. Low birth weight infants had an initial catch-up in growth, however, on average they had a smaller mean BMIz and HAZ than normal birth weight counterparts. Conversely, high birth weight infants experienced an initial slowing of growth, but they remained to heavier and taller than normal birth weight counterparts. Infants with rapid weight gain (RWG) had a larger average BMIz, but a smaller average HAZ, when compared to those without RWG. No significant association was found for child sex, maternal age, maternal education, breastfeeding duration and timing of solid introduction.

Conclusions

Maternal pre-pregnancy BMI, child birth weight and RWG were important determinants of growth trajectories in early childhood. Recognizing these determinants has particular relevance for design of future intervention strategies to target at-risk groups.

Oral Presentations Session 6: Childhood and Adolescence II

24-MONTH SAFETY SUMMARY OF PHASE 2 STUDY IN CHILDREN WITH GROWTH HORMONE DEFICIENCY ADMINISTERED ONCE-WEEKLY WITH CTP-MODIFIED HUMAN GROWTH HORMONE (MOD-4023)

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Background and Aims

Growth hormone (GH) replacement therapy requires daily injections, which may cause poor compliance, inconvenience and distress for patients. CTPmodified human GH (MOD-4023) is developed for once-weekly administration in GH-deficient (GHD) adults and children. The safety and tolerability of MOD-4023 administered subcutaneously (SC) once weekly was evaluated in a Phase 2 study in GHD children for 24 months.

Methods

A randomized, controlled Phase 2 study in GHD children receiving SC injections of one of three MOD4023 doses (0.25, 0.48, and 0.66 mg/kg/week) once a week, or daily hGH (34 µg/kg/day) for 24 months. Safety assessments included adverse events (AEs), injection site reactions, vital signs and physical condition. Laboratory assessments included glucose and lipid metabolism, blood biochemistry and immunogenicity.

Results

During MOD-4023 treatment, no severe AEs were reported. A similar incidence of AEs was reported by patients treated with MOD-4023 and by patients receiving daily hGH. No injection site-related reactions were observed. Laboratory findings supported the MOD-4023 treatment tolerability. Overall, no significant changes were noted in glucose levels, insulin, HbA1c or vital signs.

Conclusions

A promising safety and tolerability was demonstrated for MOD-4023 during treatment for up to 24m in doses between 0.25-0.66 mg/kg/week. No unexpected AEs were considered to be MOD-4023-related. This supports the ongoing development of MOD-4023 for once-weekly treatment of GHD children. A pivotal Phase 3 study will be initiated at 0.66 mg/kg/week, and patients receiving the lower MOD-4023 doses will be switched to this dose for long-term assessment.

Oral Presentations Session 6: Childhood and Adolescence II

24-MONTH EFFICACY SUMMARY OF A PHASE 2 STUDY IN CHILDREN WITH GROWTH HORMONE DEFICIENCY TREATED ON WEEKLY BASIS WITH MOD-4023, A LONG-ACTING GROWTH HORMONE

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Background and Aims

Currently, Growth hormone (GH) replacement therapy requires daily injections, which may cause poor compliance, inconvenience and distress. OPKO Biologics' CTPmodified hGH (MOD4023) was developed for once-a-week administration in growth hormone-deficient (GHD) adults and children. The efficacy of once-weekly subcutaneous (SC) administration of MOD-4023 was evaluated for 24 months in a Phase 2 study in GHD children.

Methods

A randomized, controlled Phase 2 study in children with GHD receiving SC injections of one of three MOD4023 doses once a week (0.25, 0.48, and 0.66 mg/kg/week) vs. daily hGH (34 µg/kg/day). Subjects continued with the same dose in an open-label extension (OLE) that will assess growth until marketing approval. Height velocity (HV) results during the 2nd year of MOD-4023 treatment were compared to historical controls (Ranke et al., 2010), and IGF-1 and IGFBP-3 levels were monitored.

Results

HV analysis included full dataset for patients who completed 24m of treatment. All MOD-4023 doses demonstrated promising 2nd year growth, while the two higher doses resulted in better growth in comparison to the lower dose (0.25 mg/kg/week), in line with reported historical control (Ranke et al., 2010).

Conclusions

The efficacy of single weekly MOD-4023 for treatment of pediatric GHD was further confirmed during the 2nd year of treatment. This further affirms that a single weekly injection has the potential to replace daily hGH in GHD children. A pivotal Phase 3 study will be initiated at 0.66 mg/kg/week. Patients receiving the lower MOD-4023 doses will be switched to this dose for long-term assessment.

Oral Presentations Session 6: Childhood and Adolescence II

EXCLUSIVE CONSUMPTION OF FAST-FOOD DIET IMPAIRS RATS' BONE DEVELOPMENT AND QUALITY

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Background and Aims

Endochondral ossification in the growth-plates (GP) provides a narrow window of opportunity to achieve optimal bone size and quality. Modern western diet has negative health implications; however, its effects on skeleton development have not been explored.

Methods

In this research, which initially aimed at studying the mechanisms by which obesity affect the postnatal skeleton development, we decided to add one more group in addition to the traditional high-fat and high-sucrose diets. This group of young rats was fed with a whole diet based on favorite children food bought in McDonald's and Coca-Cola as representative of the fast-food industry.

Results

We show that young rats, fed exclusively with McDonald's hamburger meals suffer from growth retardation due to GP lesions within the epiphysis and metaphysis of the tibiae. Bone mineral density decreased significantly, structural parameters of trabecular and cortical bone deteriorated dramatically, as did the mechanical performance of the entire bone. Supplementations with either multi-vitamins and minerals, or calcium alone resulted in partial rescue of phenotypes for both GP and bone, but were accompanied by kidneys' calcium deposits.

Conclusions

Our findings highlight for the first time the potential harmful effects of a fast-food consumed by young populations worldwide, on bone development and strength.

Oral Presentations Session 6: Childhood and Adolescence II

NO ASSOCIATION BETWEEN FREE SUGAR INTAKES AND BODY WEIGHT STATUS OF TWO-YEAR OLD IRISH CHILDREN

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Background and Aims

A high level of free or added sugar intake is of concern, because of its association with poor dietary quality, obesity and risk of NCDs. We aimed to describe the intakes and sources of sugar in the diets of two-year old children in Ireland and evaluate their association with body weight status and impact on dietary quality.

Methods

Dietary intake data were collected from 2 year old children participating in the Cork BASELINE Birth Cohort Study using a two-day weighed food diary ($n = 468$).

Results

Mean (SD) total sugar and free sugar intakes were 76.5 (20.6) and 31.0 (16.4) g/day, respectively, representing 27.0 and 10.8 % TE intake, respectively. Compliance with the WHO recommendation of free sugar intakes <10% TE was observed in 47% of children and 15% met the conditional recommendation of free sugar intakes <5% TE. No association was observed between total or free sugar intake and body weight status at 2 years. Higher consumers of added sugar had poorer dietary quality than their counterparts, as indicated by higher energy intakes, along with lower intakes of calcium and zinc. Further, children who did not meet the <10% TE recommendation had higher intakes of sugar-sweetened beverages, confectionary, desserts and fromage frais and lower intakes of cows' milk, potatoes, vegetables and fortified breakfast cereals.

Conclusions

Over half of young children in this study exceeded the WHO recommendation for added sugar intake. Substituting sugar-sweetened beverages, confectionary and desserts with low-energy, nutrient-dense foods would benefit the nutritional quality of the diet of Irish toddlers.

Oral Presentations Session 6: Childhood and Adolescence II

THE EFFECT OF TWO PROBIOTIC STRAINS ON DIARRHEA IN CHILDREN WITH SEVERE ACUTE MALNUTRITION - AN INTERVENTION STUDY IN UGANDA

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Background and Aims

Severe acute malnutrition (SAM) is a global challenge responsible for 0.5-1 million child deaths annually with diarrhoea being one of the most common, direct causes of death. We aimed at investigating the effect of probiotics on diarrhoea during in- and outpatient treatment of children with SAM.

Methods

A randomized, double-blind, placebo-controlled study was conducted involving 400 Ugandan children hospitalized with SAM. The children received one daily dose of a combination of LGG and BB-12 (10 billion colony-forming units, 5+5) or placebo during hospitalization and for a subsequent 8-12 week outpatient treatment period. Number of days with diarrhoea during hospitalization was the primary outcome. Secondary outcomes included other diarrhoea outcomes, pneumonia, weight gain, and recovery. All outcomes were analyzed separately for in- and outpatient treatment. In addition, the association between days with diarrhoea, dehydration and mortality during hospitalization were assessed.

Results

There was no effect of probiotics on days with diarrhoea during inpatient treatment (adjusted difference +0.2 days [95% CI -0.8; 1.2], $p=0.69$). However, a reduction in diarrhoea days was found in the probiotic group during outpatient treatment (adjusted difference -2.2 days [95% CI -3.5; -0.3], $p=0.025$). There were no effects of probiotics on other secondary outcomes. Twenty-six patients died in the probiotic versus 20 in the placebo group ($p=0.38$). Diarrhoea and dehydration were strongly associated with increased mortality during hospitalization.

Conclusions

BB-12 and LGG had no effect on diarrhoea in hospitalized children with SAM. Probiotics may have a role in community-based treatment of malnourished children, but more studies are needed to investigate this.

Oral Presentations Session 6: Childhood and Adolescence II

EVALUATING THE USE OF A NOVEL WALLCHART TOOL TO IDENTIFY STUNTED ADOLESCENTS IN MALAWI

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Background and Aims

Stunting is a form of chronic malnutrition defined by low height-for-age that affects 159 million children worldwide. The gold standard stunting assessment uses height-for-age Z-score (HAZ) calculation. It is often time-intensive and challenging to obtain sufficiently accurate HAZ in resource-limited settings like Malawi. We developed a novel wallchart to rapidly identify stunted adolescents in such settings. We evaluated its performance against standard HAZ assessment and other methods currently used in clinical practice.

Methods

This was a non-interventional diagnostic accuracy study undertaken in Lilongwe, Malawi. We recruited adolescents aged 8-19 years. We determined each adolescent's stunting status separately using the wallchart, WHO lookup tables, and WHO growth charts. These were compared against gold standard HAZ – calculated using *AnthroPlus* WHO software. Health surveillance assistants performed all measurements, which were repeated by a study field-worker. We also measured time taken using each method.

Results

We recruited 244 adolescents. The wallchart had an overall accuracy of 95.5% (kappa=0.91) and was faster than lookup tables by an average of 62.5% (41.4sec; $p<0.001$) per measurement. The WHO lookup tables and growth charts had overall agreements of 59.4% (kappa=0.36) and 61.9% (kappa=0.31) respectively. At the HAZ-2 cut-off, the wallchart had a sensitivity of 97.6% (95%CI: 91.5-99.7) and specificity of 96.3% (95%CI: 92.1-98.6).

Conclusions

We found that the wallchart is an accurate and efficient method for identification of stunted adolescents by minimally trained health workers. The WHO lookup tables and growth charts performed poorly in comparison. Therefore, the wallchart may be used to improve stunting assessment in resource-limited settings.

Oral Presentations Session 6: Childhood and Adolescence II

THE RELATION OF SOCIOECONOMIC STATUS TO OVERWEIGHT, OBESITY AND THINNESS IN DUTCH, TURKISH, MOROCCAN AND SOUTH ASIAN CHILDREN IN THE NETHERLANDS

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Background and Aims

The influence of socioeconomic factors on thinness, overweight and obesity in children of different ethnic groups in the Netherlands is not well known. Aim of this study was to gain insight into the association between socioeconomic status and thinness, overweight and obesity in children from different ethnicities living in the Netherlands.

Methods

A cross-sectional population based study of 36,208 children aged 2 through 15 years of Dutch, Turkish, Moroccan, and South Asian descent, with 109,769 measurements of height and weight.

Prevalence of thinness, overweight, and obesity was based on the International Obesity Taskforce and ethnic specific BMI cut-offs (in South Asian children), and related to Area Deprivation Score (ADS) as a proxy for SES. Logistic regression was used for the analyses.

Results

ADS was positively associated with overweight. However, the strength of association differed between ethnicities, in Dutch (OR 1.229, 95% CI 1.190-1.269), Turkish (OR 1.073, 95% CI 1.016-1.133) and Moroccan children (OR 1.074, 95% CI 1.007-1.146). The same applied for obesity, in Dutch (OR 1.798, 95% CI 1.677-1.927), Turkish (OR 1.281, 95% CI 1.183-1.386) and South Asian children (OR 1.125, 95% CI 1.067-1.187). The overweight and obesity prevalence was higher for Turkish, Moroccan and South Asian children compared to Dutch children with the same ADS, with South Asian children having the highest prevalence of obesity (22.3%).

ADS was not associated with the prevalence of thinness.

Conclusions

SES as proxied by ADS only partly explains differences in overweight and obesity prevalence, whereas thinness was not related to ADS.

Oral Presentations Session 6: Childhood and Adolescence II

SHRINKING HEIGHT IN CHILDREN DUE TO REDUCED FETAL GROWTH: FINDINGS FROM A SERIAL NATIONAL CROSS-SECTIONAL STUDY IN JAPAN (1990-2010)

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Background and Aims

Adult height, an easily measurable biomarker of early life environment and known to be related to long term health, has observed a secular trend of increase in most developed countries. In Japan, adult height had continuously increased since world war II, until a recent declaration in 2010 that it had plateaued. Concurrently, Japan has observed an increase in low birthweight births since 1980, reaching 9.6% of all births in 2010.

Methods

We used data from the National Growth Survey on Preschool Children (n=9,079), a decennial national survey on anthropometric measurement of preschool children. We observed trends in height between 1990 and 2010 among children aged 3 to 6, as well as how secular trends in maternal and infant demographics attribute to this change.

Results

Despite having taller mothers, children in 2010 were on average 3 (0.9-5.2) mm shorter with 1.3 (1.0, 1.7) times higher risk of short stature, compared to children of the same age in 1990. The decrease was larger among children born appropriate-for-gestational-age compared to those born small-for-gestational-age (and have been provided the opportunity to receive growth hormone treatment if of short stature, since 2007). Mediation analysis showed decrease in birthweight z-score explained 41% of the secular trend in height, while changes in maternal demographics (more older, primiparous mothers, and multiple pregnancies) and decrease in gestational length over the 20 years minimally explained the trend.

Conclusions

Despite mothers becoming taller, children's height in Japan has decreased over these twenty years, which can be largely attributed to secular reduction in fetal growth.

Oral Presentations Session 7: Obesity II

EARLY INTRODUCTION OF COMPLEMENTARY FOODS AND RISK OF OVERWEIGHT IN FORMULA-FED AND BREASTFED CHILDREN

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Background and Aims

Many infants are introduced to complementary foods (CF) earlier than recommended. It has been suggested that early introduction of CF increases the risk of childhood overweight. We investigated whether introduction of CF before 4 months of age increases the risk of overweight throughout childhood, and whether the risk differs for formula-fed and breastfed children.

Methods

We used data from 2611 participants of the PIAMA birth cohort. Parents kept records of their child's age when CF were first introduced. Weight and height were reported regularly until age 17. In all children and separately in formula-fed and breastfed children, we investigated with GEE analysis whether those introduced to CF at ≤ 4 months of age (early), had higher odds of being overweight between 1 and 17 years of age than children introduced to CF at > 4 months of age (later).

Results

Children with early CF introduction had higher odds of being overweight throughout childhood (OR 1.32, 95%CI 1.19, 1.47) than children with later introduction of CF. The association was similar in formula-fed (OR 1.51, 95%CI 1.17, 1.94) and breastfed children (OR 1.32, 95%CI 1.19, 1.47). The duration of breastfeeding modified the association: shortly breastfed children, but not long breastfed children with early introduction of CF had higher odds of being overweight (OR 1.48, 95% CI 1.26, 1.73) and 1.02, 95% CI 0.86, 1.22, respectively), compared to those with later introduction of CF.

Conclusions

Especially mothers who are not breastfeeding at the time CF were introduced had a higher the risk of overweight in their children.

Oral Presentations Session 7: Obesity II

ESTIMATION OF BODY COMPOSITION IN CHILDREN USING PHOTOGRAMMETRIC ANTHROPOMETRY

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Background and Aims

Body Mass Index (BMI) and BMI z-score are widely used to assess adiposity during childhood. However these measurements fail to determine body fat content, which can be used as a tool to accurately assess weight-related health risks in children. While sophisticated measurement methods exist to measure body composition, such as deuterium dilution and air-displacement plethysmography, they are cumbersome, costly or take a lot of time. Therefore, an alternative technique is developed to estimate the body fat status in children, by means of photogrammetric anthropometry, with the same versatility and ease of use as the BMI and BMI z-score. In photogrammetric anthropometry, measurement of body proportions is performed on digital photographs using the photometry software Paediatric Morphometrics designed by our research group.

Methods

We investigated the correlations between anthropometric ratios, fat mass and BMI z-score in this cross-sectional study, performed in 133 children between 2 and 17 years of age.

Results

All anthropometric ratios correlated significantly with both fat mass and BMI z-score. A linear regression model was made to estimate fat mass based on anthropometric ratios. A median difference in fat mass of 3.6% IQR [1.5 – 5.9] ($r^2=0.85$) was seen compared to the measurements of fat mass using deuterium dilution and air-displacement plethysmography.

Conclusions

Photogrammetric anthropometry provides a fast and easy to use method to estimate the body composition in children based on body proportions.

Oral Presentations Session 7: Obesity II

IMPACT OF NUTRITION DURING LACTATION ON LATE-ONSET CARDIO-METABOLIC PATHOLOGIES IN MICE BORN WITH IUGR

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Background and Aims

Intrauterine Growth Retardation (IUGR) affects around 5% of human births in western countries and is associated with long-term deleterious effects like cardio-metabolic diseases. Previous studies also indicated that changing nutrition during post natal period could worsen pathologies later on. We thus generated an IUGR mouse model to study effects of different regimen in lactation in the induction of adult metabolic pathologies.

Methods

Pregnant mice were fed with a low protein diet during their third week of gestation to induce IUGR of fetuses. At birth, IUGR newborns were cross-fostered to a normally fed dam that gave birth the same day, and litter size were normalized at 3, 6 or 10 pups per dam to induce overfeeding, normal feeding or restriction during lactation.

Results

We observed that IUGR mice normally or overfed during lactation presented with overweight as adults. More, lactating regimen seem to modulate metabolic alterations in IUGR mice since overfed IUGR's develop insulin resistance faster than IUGR normally fed ones and that, in contrast, restricted IUGR's seem to be protected. Our results indicate that this physiological alteration is associated with permanent decrease of AKT protein levels in adults and involve epigenetic mechanisms. Furthermore, a coherent post-transcriptional regulation of AKT's inhibitor PTEN was also observed and may involve microRNA.

Conclusions

In agreement with the Predictive Adaptive Response hypothesis, these results suggest the importance of a coherent nutrition during the entire perinatal period for the emergence of adult cardio-metabolic pathologies. Our data suggest that these changes are associated with different and coherent epigenetic modifications.

Oral Presentations Session 7: Obesity II

A NUTRIGENETICS APPROACH TO STUDY THE IMPACT OF GENETIC AND DIETARY FACTORS ON OBESITY: FINDINGS FROM THE GENUINE COLLABORATION

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Background and Aims

Obesity is a heritable trait that arises from the interactions between multiple genes and lifestyle factors such as diet and physical inactivity. Although several studies have examined the gene-diet interactions, the findings have been quite inconsistent and hence, unable to develop an optimum diet for each ancestral population. Hence, GeNuIne (Gene-Nutrient Interactions) collaboration has been initiated to perform gene-diet interactions on obesity-related traits using population-based studies from various ethnic groups.

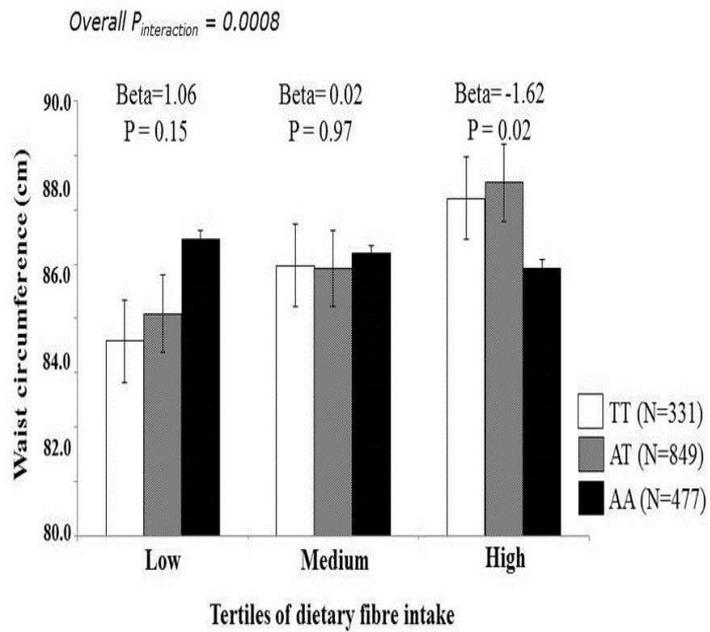
Methods

Two thousand study participants were recruited from the cross-sectional Chennai Urban Rural Epidemiological Study, an epidemiological study conducted on a representative population of Chennai, India. Ten genetic variants from fat mass and obesity associated (*FTO*) and lipoprotein lipase (*LPL*) genes were chosen as candidates for obesity and blood lipid traits, respectively. Dietary intake was assessed using a semi-quantitative food frequency questionnaire.

Results

We found that carbohydrate ($P_{\text{interaction}}=0.04$) and dietary fibre ($P_{\text{interaction}}=0.0008$) intakes (Figure 1) modified the association of the *FTO* variant with obesity, with the effect of the variant being more pronounced among those who consumed high levels of carbohydrate and dietary fibre. In addition, we found that individuals carrying C allele of *LPL* variant have increased risk of low HDL-C when consuming a high fat diet compared to T allele carriers ($P=0.001$).

Figure 1:



Conclusions

Our study has identified novel gene-diet interactions in a South Asian population and also confirmed the significance of performing nutrigenetics analysis, given the complex nature of genetic predisposition to cardiometabolic traits such as obesity and its related traits.

Oral Presentations Session 7: Obesity II

LONG-CHAIN POLYUNSATURATED FATTY ACIDS AND EXTENSIVELY HYDROLYZED CASEIN SUPPORT METABOLIC FLEXIBILITY IN A UCP-1 REPORTER MOUSE MODEL OF OBESITY

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Background and Aims

The prevalence of childhood obesity and related problems is rising. In this study, the early effects of LCPUFAs (ARA+DHA) and milk-derived bioactive peptides (extensively casein hydrolysate, eCH) were investigated in an UCP1-luciferase knock-in mouse reporter model. Their potential to support metabolic flexibility under an obesogenic challenge later in life was also assessed.

Methods

Male Ucp1+ /LUC mice (4 weeks old) were fed standard chow or standard chow supplemented with ARA+DHA, hydrolyzed casein diet, or hydrolyzed casein+ARA+DHA diet for 8 weeks. Mice were switched to high-fat diet (HFD) with or without ARA+DHA, or eCH, or a combination thereof for another 12 weeks. *In vivo* luciferase activity was assessed across the study using imaging. Body weight gain, systemic inflammation (IL1 β , TNF α by ELISA) and metabolic flexibility (glucose & insulin tolerance tests, plasma metabolic risk factors) were determined.

Results

Nutritional interventions significantly induced *in vivo* luciferase activity in early development and later in life compared to control or HFD groups respectively. Also body weight gain and systemic inflammation were reduced against high fat diet. ARA/DHA, the eCH or the combination thereof improved glucose tolerance, insulin sensitivity and plasma adiponectin levels versus HFD groups and attenuated plasma levels of TG, TC, FFA, insulin, Leptin, Resistin, FGF21, ALT and AST.

Conclusions

Early nutritional intervention with ARA/DHA, eCH and their combination stimulate browning and can attenuate HFD-induced obesity and related metabolic disturbances. Their impact on systemic inflammation as well as improving metabolic flexibility might provide further rationale for the beneficial effects observed.

Oral Presentations Session 7: Obesity II

MACRONUTRIENT COMPOSITION OF DIET IN INFANCY IS RELATED TO GROWTH AND ADIPOSITY UP TO THE AGE OF 9 YEARS, IRRESPECTIVE OF CHILDHOOD DIET

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Background and Aims

We examined associations of macronutrient composition of the diet in infancy with growth and detailed measures of body composition up to the age of 9 years among 3,564 children participating in the Generation R Study.

Methods

Dietary intake was assessed with food-frequency questionnaires at the ages of 1 and 8 years. We calculated intakes of total protein and protein from different sources; of total carbohydrates, polysaccharides, monosaccharides and disaccharides; and of total, saturated, monounsaturated and polyunsaturated fat. Height and weight were repeatedly measured between the ages of 1 and 9 years. Fat and fat-free mass were measured at 6 and 9 years using dual-X-ray absorptiometry. We calculated age- and sex-specific SD scores for height, weight, body mass index (BMI), fat-mass index (FMI), and fat-free mass index (FFMI). Macronutrient intakes were expressed in energy percentages and entered in multivariable models in which we examined different macronutrient substitution effects.

Results

Results from multivariable linear mixed models showed that higher intake of animal protein (both dairy and non-dairy) was associated with a higher height, weight, BMI and FMI, but not FFMI, up to age 9 years, irrespective of whether it was replaced by carbohydrates or fats. No significant associations were observed for the other macronutrients. Associations for protein remained significant after adjustment for macronutrient intake at age 8 years.

Conclusions

Protein intake in infancy was associated with higher childhood body fat independent of current diet. Our results thus suggest that later childhood diet does not abate adverse effects of a high-protein diet in infancy on adiposity.

Oral Presentations Session 8: Neonatal & Prematurity II

NUTRITIONAL PROGRAMMING OF POSTNATAL GROWTH DURING LACTATION : IGF-I PREFERENTIALLY STIMULATES AXON GROWTH OF GHRH NEURONS

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Background and Aims

Alteration of nutrition early-in-life has been particularly involved in the normal development and in the programming of late-onset pathologies. We previously demonstrated in mice that nutrition during lactation can stimulate growth and program the adult final size through a different setting of the neuroendocrine somatotrophic axis. This programming can be genetically mimicked by heterozygous invalidation of IGF-1R in the brain and may then particularly involve IGF-I, which is strongly regulated by nutrition.

Methods

Nutritional restriction during lactation by increasing litter size from 6 to 10 pups per dam permanently decreases growth of the progeny.

Results

The growth alteration was associated with a delayed innervation of the median eminence by axons of growth hormone releasing hormone (GHRH) neurons in the first week of life, which induce a permanent pituitary hypoplasia in growth hormone secreting cells. Using *in vitro* cultures of arcuate nucleus explants harvested from normally fed GHRH-eGFP pups, we observed that IGF-I preferentially stimulates axon growth of GHRH neurons. On the other hand, GHRH neurons of explants micro-dissected from restricted mice present a resistance to IGF-I stimulation despite normalized conditions of culture. Molecular analyses from arcuate explants indicate that IGF-I stimulates axon growth through both AKT and MAPK signaling pathways, with an important role of the former one. Furthermore, arcuate neurons from restricted pups present a resistance of AKT activation specifically.

Conclusions

All together, our results highlight a new role for IGF-I on GHRH neurons development and unravel a crucial mechanism by which nutrition during the early postnatal period can program growth.

Oral Presentations Session 8: Neonatal & Prematurity II

HYPOGLYCEMIA SCREENING IN NEWBORNS IN THE NETHERLANDS (THE HYPONNL STUDY) – RESULTS OF THE PILOT

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Background and Aims

To determine incidence, severity and timing of neonatal hypoglycemia in different groups at risk. To study the influence of feeding regimes on hypoglycemia and breastfeeding at discharge.

Methods

Single centre retrospective cohort study, including all newborns at risk (gestational age ≥ 35 weeks, birth weight ≥ 1800 gram) screened for hypoglycemia (blood glucose level <2.6 mmol/L) between January 2009 and December 2011.

Results

A total of 1097 infants were analysed. The incidence of hypoglycemia was 42%, lowest in small for gestational age infants (33%) and highest in infants with two or more risk factors (55%) especially in large for gestational age infants with additional risk factors (67-100%). Incidence, frequency and severity of hypoglycemia did not differ between subgroups of small for gestational age infants (p_{10-p5} , $p_{5-2.5}$, $p_{<2.5}$). Median time of first hypoglycemic event was 3.2 (range 0.55-27.9) hours of age. Ninety-seven percent of first hypoglycemic events occurred in the first 12 hours of age and all were mild. Incidence of hypoglycemia was higher in the group with standard supplemental feeding (45% vs 34% no standard supplemental feed), standard supplemental feeding was associated with a decrease in exclusive breastfeeding at discharge (30% vs. 60% without standard supplemental feeding, $p < 0.001$).

Conclusions

Neonatal hypoglycemia is common among newborns at risk especially in the presence of two or more risk factors. Infants at risk should be screened for at least 12 hours after birth. The influence of standard supplemental feeding on the incidence of hypoglycemia and the success rate of breastfeeding remains uncertain.

Oral Presentations Session 8: Neonatal & Prematurity II

VITAMIN A SUPPLEMENTATION TO NEONATAL PIGLETS RESULTS IN SUSTAINED IMPROVEMENT IN LIVER VITAMIN A STORES BUT REDUCED GROWTH COMPARED WITH PLACEBO

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Background and Aims

Neonatal vitamin A (VA) supplementation is being evaluated as public health policy for prevention of infant mortality, but inconsistent results in mortality trials demand mechanistic work to determine biological plausibility. This study investigated absorption, transport, distribution, and storage of single, large VA doses administered shortly after birth.

Methods

Newborn piglets ($n = 313$) were dosed orally with 0, 25,000, 50,000, or 200,000 IU VA in oil within 12 h of birth. Blood was drawn in a staggered design to determine absorption and storage from 0.5-240 h post-dose. Liver, lung, kidney, spleen, and adrenal VA concentrations were determined from 7-240 h post-dose.

Results

Serum retinol and retinyl ester concentrations responded by treatment (both $P < 0.0001$); however, differences among groups disappeared by 96 h. Liver VA concentrations responded by treatment ($P < 0.0001$). Control piglets at 10 d ($0.05 \pm 0.02 \mu\text{mol/g}$) were $<0.1 \mu\text{mol/g}$ (deficiency cutoff), while all groups receiving VA maintained adequate concentrations. Lung, kidney, and spleen VA concentrations were elevated to 96 h, and adrenals to 240 h ($P \leq 0.0077$). Body weight was affected by treatment ($P = 0.0002$); VA deficient piglets weighed more 240 h post-dosing.

Conclusions

High-dose VA administered to newborn piglets is well-absorbed, appears in serum primarily as retinyl esters, and is taken up dose-dependently in all tissues studied; however, enhancement did not persist in extrahepatic tissues. Longer follow-up time on healthy weight gain remains to be elucidated.

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Oral Presentations Session 8: Neonatal & Prematurity II

RESPONSES OF PRETERM PIGS BEING FED BOVINE COLOSTRUM AND FORMULAS WITH EITHER LACTOSE OR MALTODEXTRIN

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Background and Aims

Enteral nutrition is restricted for neonatal preterm infants because of the increased risk of necrotizing enterocolitis (NEC), particularly when breast milk is not available. The associated extrauterine growth retardation increases the risk of disability and highlights the need to improve nutrition support for neonatal preterm infants.

Methods

We evaluated responses of preterm pigs relevant to 32 week preterm infants to 6-7 days of feeding bovine colostrum or one of two formulas with either lactose or maltodextrin as the source of carbohydrate (120 ml/kg-d). Survival, NEC incidence, and growth were evaluated. At conclusion intestinal dimensions and weights of other organs were recorded, and rates of intestinal glucose uptake were measured.

Results

Feeding the formula with maltodextrin resulted in a 50% incidence of NEC with 30% mortality. NEC was not detected among pigs fed the lactose-based milk replacer or colostrum. Growth of pigs fed bovine colostrum was minimal or even negative (-0.70 + 0.26) and was lower than that of surviving pigs fed the formulas with maltodextrin or lactose (0.77 + 0.27 and 0.93 + 0.18). Colostrum resulted in a heavier small intestine (g/kg; $P < 0.05$), but not higher total small intestine capacities to transport glucose.

Conclusions

Colostrum protects preterm pigs against NEC, but does not promote body weight gain, whereas a milk replacer with only lactose as the source of carbohydrate did not cause NEC and does promote growth. The preterm pig model can be used to evaluate how carbohydrates and other nutrients influence NEC, growth, health, and development after preterm birth.

Oral Presentations Session 8: Neonatal & Prematurity II

LEUCINE IMPROVES GROWTH OF PRETERM PIGS

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Background and Aims

Neonatal growth is a determinant of neurological and long-term outcomes, especially for infants born preterm and small for gestational age (SGA).

Methods

We evaluated responses of preterm pigs fed for 6 to 7 days (120 ml/kg-d) a lactose based formula with two levels of protein (50 and 100 g/L) with either leucine (10 g/L) added as a growth promoter or alanine (6.8 g/L) as the control.

Results

Growth rate was influenced by birth weight ($P < 0.05$) and was higher for pigs fed the two low protein formulas (3.30 ± 0.14 %/d vs 2.74 ± 0.27 ; $P = 0.02$), which may be related to protein sparing by the MCT oil used to keep the formulas isocaloric. The growth response to leucine compared with alanine was more pronounced for the low protein formula (14% vs 8%), and particularly for SGA pigs born at < 700 g ($P < 0.01$ for comparison with pigs born > 1000 g). The low protein formulas resulted in lower blood urea nitrogen values ($P < 0.05$), smaller stomachs and small intestines (g/kg), reduced forskolin stimulated chloride secretion, but glucose uptakes were similar to pigs fed the high protein formula. Leucine increased total small intestinal activity for lactase, but not maltase and maltodextrinase.

Conclusions

These findings indicate leucine is an effective growth promoter for preterm pigs as previously reported for term pigs, particularly for pigs considered as SGA, and more so when added to low protein formula. The preterm pig is a translational model for evaluating growth and developmental responses to nutrition support strategies and growth promoters.

Oral Presentations Session 8: Neonatal & Prematurity II

EFFECTS OF FISH OIL SUPPLEMENTATION AND/OR 5-METHYL-TETRAHYDROFOLATE ON COLOSTRUM FATTY ACID COMPOSITION

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Background and Aims

Maternal milk and its long-chain polyunsaturated fatty acids (LC-PUFAs) are important during early growth and development. We aimed to evaluate the effect of fish oil (FO) and/or 5-methyl-tetrahydrofolate (5-MTHF) supplementation during pregnancy on colostrum PUFA concentrations, and the role of maternal FADS genetic polymorphisms (SNPs) on such levels in human milk.

Methods

311 healthy pregnant women from NUHEAL study, randomly received daily supplementation with FO [500mg docosahexaenoic acid (DHA)+150mg eicosapentaenoic acid (EPA)], 400µg 5-MTHF, FO+5-MTHF, or placebo, from gestation week 20 until delivery. Fatty acid composition was analyzed in 182 colostrum samples (Spain and Germany) and 17 SNPs of FADS1, FADS2, FADS3 were studied. Statistical analyses were performed by R software and Stata 11 (P<0.05).

Results

Linoleic acid (LA) and DHA concentrations were significantly higher in Spanish than German colostrum; however, α-linolenic acid (ALA) concentrations were lower in Spanish. LA/ALA ratio was significantly higher in mothers supplemented with FO+5-MTHF than those with FO. Arachidonic acid (AA) and DHA concentrations were negatively associated with FADS1 rs174548, rs174556 and FADS2 rs174576, rs174578. FADS1 rs174574 was also negatively associated with LA concentrations.

Conclusions

Significant differences found in colostrum composition between Spanish and German mothers suggest a potential effect of dietary intake. FADS1 and FADS2 polymorphisms seem to have modulatory effects on LC-PUFA levels in colostrum, independently of the country of origin. Mothers receiving FO+5-MTHF during pregnancy showed higher LA/ALA ratios. The impact of these results on child growth and development will be explored.

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Oral Presentations Session 9: Infancy II

PRE-PREGNANCY MATERNAL WEIGHT-DEPENDENT IMPRINTING OF NEONATAL GUT MICROBIAL COMMUNITY AND METABOLISM

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Background and Aims

Several experimental and epidemiological studies have shown that nutrition during prenatal and postnatal stages has a great impact on the development of infant's gut microbiota. Infant gut microbiota is a complex ecosystem that develops a variety of unique functional repertoire that affects the physiology of the individual.

Our goal was to study the gut microbial community composition and function in infants in relation to mothers' anthropometric parameters and nutritional status.

Methods

The PREOBE project is an observational cohort study on healthy normo-, overweight and obese pregnant women. We analysed associations between the gut microbiota of 122 children at 6- (n = 46) and 18 months (n = 76) of age, assessed by 16S rRNA gene sequencing and metaproteomics, depending on their mother's body mass index.

Results

We observed an important shift in gut microbiota composition from 6 to 18 months old, with a significant enrichment in *Bacteroidetes* and *Verrucomicrobia*. When we classified the samples based on mothers' BMI, applying Unifrac distance, we observed three different clusters depending on whether the mother was normal weight, overweight or obese. Moreover, gut microbial function in children from obese mothers was significantly enriched in glycosidases, β -glucosidase and α -galactosidase.

Conclusions

These results suggest that the composition and metabolic performance of the gut microbiota in the infant may depend on maternal metabolic state before and during pregnancy.

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Oral Presentations Session 9: Infancy II

THE ASSOCIATION OF PRE-PREGNANCY BODY WEIGHT STATUS WITH CESSATION OF EXCLUSIVE BREASTFEEDING IS MODIFIED BY PARITY IN A FRENCH NATION-WIDE BIRTH COHORT (EPIFANE, 2012)

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Background and Aims

We investigated the relationship between pre-pregnancy Body Mass Index (pBMI) and exclusive breastfeeding duration among primiparous and multiparous women in metropolitan France.

Methods

3,368 mother-child dyads were included at birth in the Epifane cohort from 136 maternity wards selected at random in metropolitan France. Height and pre-pregnancy weight, used to compute pBMI, were self-reported at birth. Information on breastfeeding was collected at maternity ward and by phone interviews at 1, 4, 8 and 12 months after birth. We used Poisson regression, stratified on parity, to assess the association between pBMI and duration of exclusive breastfeeding adjusted for sociodemographic characteristics and pregnancy and delivery outcomes.

Results

Analyses were performed among 1,766 women (119 underweight, 1,205 normal weight, 310 overweight and 132 obese before pregnancy) who had initiated an exclusive breastfeeding. Among primiparous, overweight women were more likely to stop exclusive breastfeeding earlier than normal-weight after adjusting for all confounders (IRR=0.76 (0.59-0.97)). In the final model, no significant difference was found between obese and normal-weight women (IRR=0.95(0.70-1.29)). Among multiparous, obese women were likely to stop exclusive breastfeeding earlier than normal weight after adjusting for sociodemographic factors (IRR=0.74 (0.55-0.98)). However, this association was no significant after controlling for gestational weight gain and delivery mode (IRR=0.78 (0.59-1.04)).

Conclusions

Overweight before pregnancy was an independent risk factor for shorter duration of exclusive breastfeeding among primiparous. Among multiparous, pregnancy and delivery conditions confounded the association between obesity and duration of exclusive breastfeeding. Interventions aimed at increasing exclusive breastfeeding duration should be adapted to the mothers' characteristics, notably parity.

Oral Presentations Session 9: Infancy II

ASSOCIATION OF HEAD CIRCUMFERENCE GROWTH VELOCITY AND NEURODEVELOPMENT DURING THE FIRST 18 MONTHS OF LIFE IN HEALTHY INFANTS

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Background and Aims

We aimed to analyse the association of head circumference (HC) growth velocity during the first 6 months of life and neurodevelopment up to 18 months.

Methods

170 healthy term infants between 0-2 months of age were randomized in a double-blind study to receive either standard infant formula (F1: n=85) or a formula containing LC-PUFAs, milk fat globule membrane components and symbiotics (Nutriexpert® factor) (F2: n=85). 50 breastfed infants were also enrolled as control group. Based on growth velocity of HC from birth to 6 months of life (WHO growth standards), children were classified as slow (SG) (n=17), normal (NG) (n=89) or rapid (RG) (n=36) HC growth. Neurodevelopment was assessed using Bayley's III scales at 6, 12 and 18 months. Normal distribution was assessed by Kolmogorov-Smirnov test, and ANOVA and Chi-Square tests were performed using SPSS 22.0.

Results

No differences in growth velocity of HC or maternal pre-gestational BMI were found between the three study groups. Children born to obese mother's showed SG, and those born to normal weight mothers showed RG. At 6 months, NG and RG infants showed better scores in *fine motor skills* than SG ($p=0.030$). At 18 months, SG infants showed lower scores in *expressive communication* ($p=0.014$) and *language skills* ($p=0.012$) than NG.

Conclusions

Maternal obesity during pregnancy is associated with slow rate of HC growth; slow rate growth of HC during the first six months of life may predict a poorer cognitive development.

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Oral Presentations Session 9: Infancy II

A CAPABILITY APPROACH TO CHILD GROWTH: A THEORETICAL FRAMEWORK

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Background and Aims

Child malnutrition is an important cause of under-five mortality and morbidity around the globe. Despite national and international efforts and successes, under-five mortality rates continue to be high. The multidimensional approaches of the SDGs may suggest new directions for rethinking strategies of reduction of child mortality and morbidity.

Methods

Child growth monitoring has been developed as a tool to reduce child malnutrition and mortality. Current growth monitoring practices are based on two assumptions: (1) anthropometric measures are the appropriate indicators; (2) child growth can be assessed using one universal standard around the world. While acknowledging the relevance of current practices, we propose a different approach where child growth will be redefined as a capability set (of parents and children) that will allow for optimal growth, thereby taking into account contextual differences. Similar to Amartya Sen's seminal work on a multi-dimensional approach to development and economic growth, we propose a multi-dimensional approach to child growth going beyond the current anthropometric indicators of child growth.

Results

This paper includes a first attempt to construct a theoretical framework towards such an approach. Under the umbrella of Amartya Sen's Capability Approach, we suggest a multi-dimensional monitoring framework applying theories from social sciences and evolutionary biology. This framework will be relevant for intervention purposes, including prevention and counselling, and for making realistic comparisons between countries.

Conclusions

We aim to open up the debate in how to think about child malnutrition as reflected in a capability approach to child growth.

Oral Presentations Session 9: Infancy II

IDENTIFYING THE OPPORTUNITIES TO CURB THE BURDEN OF IRON DEFICIENCY ANEMIA IN INFANTS AND TODDLERS GLOBALLY

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Background and Aims

Background: In children 6-23-month-old Iron-Deficiency-Anemia (IDA) has severe health and economic consequences mainly due to its impact on cognitive development. Indian estimated yearly costs of IDA in 6–23-month-old children amount to intangible costs of 6.3-million DALYs and annual production losses at almost 24-billion USD equal to 1.3% of gross domestic product.

Objectives: 1) To estimate the Global Burden of IDA in infants and toddlers; 2) to identify the contribution of the fortification and supplementation strategies to curb the burden.

Methods

We used country specific parameters and WHO reported IDA prevalence as an inputs for a health economic model presented by Plessow-et-al-2015. To estimate the contribution of fortification and supplementation strategies to reduce the burden of IDA, we use the reach of fortified-baby-food and the estimated effectiveness of supplementation interventions. The effect of these interventions would curb the burden by shifting the hemoglobin distribution curves in each country.

Results

In 2015 the global annual burden of IDA in infant and toddlers were 112-billion USD and 29-million DALYs. In middle and low income countries on average food fortification decreased the economic losses by 7% and the health burden by 5% while iron supplementation contributed in about 1.2% and 1.7% respectively.

Conclusions

To further reduce the burden of IDA there would be a need to expand the penetration of fortified baby food as well as to improve the efficiency of supplementation programs that are currently in place. The relative cost effectiveness of such interventions also needs to be assessed.

Oral Presentations Session 9: Infancy II

CEREBRAL CHANGES IN PROTEIN ENERGY MALNUTRITION: A FUNCTIONAL AND ANATOMICAL STUDY

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Background and Aims

Kwashiorkor represents a group of related disorders known as protein-energy malnutrition (PEM), it is associated with cerebral changes which consequently would give rise to intellectual and developmental delay. Single photon emission computed tomography (SPECT) of the brain estimates the regional cerebral blood flow and neuronal activity.

The present study seeks to define and assess functional cerebral changes and abnormalities in a sample of infants with kwashiorkor using brain imaging and reassess them after nutritional rehabilitation

Methods

Prospective study of Twenty five infants admitted to the children hospital Ain Shams University, Cairo, with various severity of PEM . They were 15 males and 10 females, with age range between 4 and 18 (mean 15.2 ± 4.1) months. Clinical and anthropometric evaluation, laboratory tests were done in addition to hexamethyl propylene amineoxime (HMPAO) labeled ^{99m}Tc SPECT study. Twenty three PEM cases were reevaluated after 12 weeks of supervised nutritional rehabilitation.

Results

All patients with serum albumin less than 2.5 gm/dl showed significant decrease in tracer uptake (decreased neuronal activity) that predominantly affected the frontal lobe and basal ganglia. A positive correlation was documented between the severity of the disease and extent of cerebral hypoperfusion. After nutritional rehabilitation, the hypoperfusion resolved in all patients except two cases with severe disease.

Conclusions

PEM is associated with impaired dynamic functional activity of the brain Brain SPECT is an precise tool for assessing the effect of PEM on the brain. Long term rehabilitation and follow up of PEM infants must include intervention to motivate intellectual brain faculties and emotional growth.

Poster Shift 1: Childhood & Adolescence

COMPARATIVE VALIDITY OF A FOOD FREQUENCY QUESTIONNAIRE TO ESTIMATE THE HABITUAL DIETARY INTAKE OF ADOLESCENTS IN MALAYSIA

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Background and Aims

This study examines the comparative validity of the Food Frequency Questionnaire (FFQ) that was developed for Malaysia's multi-ethnic population.

Methods

Collective food data from MyHeARTs 2012 database were used to construct the FFQ. Seventy-eight participants between 13 and 15 years old in 2014 were selected through convenient sampling for test – retest study. They completed the FFQ twice, with an interval period of one week. One hundred and fifty-six MyHeARTs study participants who were 15 years old in 2014 were randomly selected for this comparative validity study. They completed a 7-day diet history (7DDH) and subsequently completed the self-administered FFQ.

Results

Intra-class correlation between the 1st and 2nd administration of FFQ were 0.71 to 0.88 for macronutrients, while correlation for micronutrients ranged from 0.67 to 0.85. Pearson's correlations between the FFQ and 7DDH for all macronutrients were statistically significant. Energy-adjusted correlations for protein, carbohydrate, and fat were 0.54, 0.63 and 0.49 respectively. Most of the micronutrients and minerals, were statistically correlated ranging from 0.31 to 0.49 after energy adjustment. The signed-ranks test showed agreement for most macro and micronutrients. Cross-classification analyses revealed that more than 70 percent of adolescents were classified into either the same or adjacent quartile of nutrient intake when comparing data of 7DDH and FFQ. No serious systematic bias was evident in the Bland-Altman plots.

Conclusions

The 200-item FFQ developed for Malaysian adolescents has moderate to good comparative validity for assessment of macronutrient and micronutrient intake.

Poster Shift 1: Childhood & Adolescence

NUTRITION MANAGEMENT THERAPY IN RETROVIRAL DISEASE PEDIATRIC PATIENT: A CASE REPORT

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Background and Aims

Growth faltering and malnutrition can be a marker of poor nutritional status in children with Retroviral Disease (RVD). Preventing malnutrition in children with RVD positive initiating Highly Active Antiretroviral Therapy (HAART) is important and can be achieved through intensive nutrition management therapy implemented by a dietitian as shown in this case report.

Methods

We report a case of growth faltering in 1-year 6-month old girl diagnosed with mildly symptomatic RVD positive (hepatosplenomegaly with anemia reactive thrombocytopenia). She initiated HAART for 3 months in view of CD4 less than 25% and viral load more than 100 000 copies/ml. She referred to a dietitian from an outpatient pediatric clinic for poor weight gain. Her body weight and height were 7.25 kg and 71 cm respectively, identified below -3 of z-score. Patient appear lethargy. Energy and protein intake were 39% and 80% from requirement. The nutrition management therapy for child with RVD positive was implemented with provision of high energy-high protein diet (142 kcal/kg and 2.6 g/kg body weight).

Results

Intensive intervention resulted increment of weight in a month (between -2 to -3 of z-score) and the rate of weight gain improved from 0.02 kg/month to 0.67 kg/month. No more lethargy reported. Energy and protein intake improved by 65% and 100% from requirement respectively.

Conclusions

This case supported the benefit of nutrition management therapy in improving patient's anthropometric indices and improves weight gain. Optimum nutritional status is associated with sustained improvement of growth and prevent early mortality in children with RVD initiating HAART.

Poster Shift 1: Childhood & Adolescence

IRON STATUS OF AND ITS NON-INFLUENCE ON HBA1C LEVELS IN DUTCH CHILDREN WITH DIABETES MELLITUS TYPE 1

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Background and Aims

Iron deficiency (ID) is either an absolute (depleted iron stores) or a functional (caused by chronic inflammation) deficiency and this differentiation is important because of therapeutic consequences. Chronic inflammation and dietary challenges in children with diabetes mellitus (DM) type 1 predisposes them to ID, although this has scarcely been studied. Furthermore, ID-anemia may influence HbA1c levels. We aimed to determine the prevalence of absolute ID and functional ID and investigate its effect on HbA1c levels in pediatric DM type 1 patients.

Methods

Multi-center prospective observational study in which the complete iron status of Dutch children with DM type 1 was determined during a regular check-up. Absolute ID and functional ID were defined based on international guidelines for serum ferritin (SF) (in patients with high-sensitive CRP<10mg/l) and zincprotoporphyrin (ZPP) and/or red blood cell distribution width (RDW), respectively.

Results

Absolute ID and functional ID were found in 13/227 (5.7%) and 100/214 (46.7%) patients, respectively, and only 15/113 (13.3%) patients had detectable anemia. HbA1c was positively correlated with hemoglobin ($r=0.147$, $p=0.027$) and SF ($r=0.179$, $p=0.007$), but not with ZPP ($r=0.051$, $p=0.448$) or RDW ($r=-0.115$, $p=0.085$). However, HbA1c levels in patients with and without a deprived iron status were not significantly different (65 ± 17 vs. 65 ± 16 mmol/mol, $p=0.815$).

Conclusions

Absolute ID was uncommon and functional ID common in Dutch pediatric DM type 1 patients. Their presence did not significantly influence HbA1c levels which could be explained by the relatively mild deprived iron status reflected by the low prevalence of anemia in our patients.

Poster Shift 1: Childhood & Adolescence

EFFECTS OF ZINC SUPPLEMENTATION AND ADMINISTRATION ON GH-IGF1 SYSTEM IN NON-ZINC-DEFICIENT SCHOOLCHILDREN

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Background and Aims

Zinc deficiency is associated with impaired growth in children. Therefore, we aimed to evaluate the effect of zinc on the secretion of hormones related with growth, in healthy schoolchildren.

Methods

This was a randomized, triple-blind study, carried out during a 3-month period. Forty schoolchildren participated in the study, 17 females and 23 males, aged 8 and 9 years. The children were divided in a control group (20 schoolchildren using 10% sorbitol) and experimental group (20 schoolchildren using zinc). All were submitted to oral zinc supplementation (10 mg Zn/day) and venous zinc administration (0.06537 mg Zn/kg of body weight). Blood samples were collected at 0, 60, 120, 180, and 210 min. All schoolchildren were also submitted to anthropometric, clinical, and dietetic assessments as well as biochemistry analyses.

Results

Oral zinc supplementation in the experimental stimulated an increase in the consumption of protein and fat ($p = 0.0007$, $p < 0.0001$, $p < 0.0001$, respectively), increased basal serum zinc ($p < 0.0001$), increased plasma alkaline phosphatase (ALP) ($p = 0.0270$), and showed a positive correlation for insulin-like growth factor 1 (IGF1), insulin-like growth factor binding protein 3 (IGFBP3), and osteocalcin (OCN), comparing before and after oral zinc supplementation ($p = 0.0011$, $p < 0.0001$, $p < 0.0446$, respectively). During intravenous zinc administration, plasma IGF1 and IGFBP3 increased significantly in the experimental group ($p = 0.0468$, $p < 0.0001$, respectively).

Conclusions

Zinc supplementation stimulated an increase in the consumption of some macronutrients and basal serum zinc and improved plasma alkaline phosphatase levels and hormones.

Poster Shift 1: Childhood & Adolescence

BREASTFEEDING, SEDENTARY BEHAVIOR AND WHEEZE AMONG PRESCHOOL-AGE CHILDREN

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Background and Aims

There is some evidence that the short duration of breastfeeding may be predictor of adverse children health outcomes not only in early life but also on the later life. The aim of this study was to evaluate the effect of breastfeeding and sedentary behaviour on 4–6 year's age child wheeze.

Methods

This KANC cohort study (Kaunas, Lithuania) recruited 1,489 pregnant women and followed the live births for 4–6 years. Questionnaire data were used to ascertain children wheeze and sedentary behaviour (3 hours or more per day by TV or computer). Logistic regression models were fitted to examine the associations as odds ratios (OR) between breastfeeding, sedentary behaviour, and risk of wheeze adjusted for relevant covariates.

Results

In the present study even 56.2% of all children were breastfed 7 months and longer. The prevalence of 4–6 year's children wheeze was 15.6%, and sedentary behaviour was reported of 19.9% children. Shorter duration of breastfeeding and children sedentary behaviour was independently associated with higher prevalence of wheeze. Children who were breastfed shorter than 7 months and were more sedentary had statistically significant higher risk for wheeze at 4–6 year's age (aOR 2.28; 95% CI 1.04–4.59).

Conclusions

Short breastfeeding and sedentary behaviour is associated with the increased rates of wheeze in the offspring at the 4–6 year's age. Health care professionals should strongly advise mothers to breastfed at least 7 months and to reduce children sedentary behaviour to prevent wheeze through childhood.

Poster Shift 1: Childhood & Adolescence

THE EFFECT OF PLACE OF RESIDENCE ON HIGH SCHOOL ADOLESCENTS' DAILY CONSUMPTION OF HIGH-FAT FOODS

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Background and Aims

The two major factors of the research are the place of residence and diet. Adolescents and particularly those that reside in the province tend to adopt the westernized dietary pattern, which mainly includes food rich in fat. The aim of this research was the study of the effect of environmental factors on the total daily consumption of high-fat foods in adolescence. Considering traditional dietary patterns have gradually begun to deviate from the norm, we focused on the residence of young respondents in urban and semi-urban centers

Methods

The survey involved 420 high school adolescent students 230 (54, 76%) boys and 190 (45, 24%) girls, aged 16-19 years, located in both urban and semi-urban areas in Thessaly, Central Greece. The anthropometric parameters were measured. The main research tool was a structured FFQ (Food Frequency Questionnaire)

Results

Dietary fats consumption is highly affected by the sex of the respondent: Boys $1063,6 \pm 719,9$ Kcal/day. Girls $739,75 \pm 504,84$ Kcal/day. Statistically significant differences were found between students that reside in urban and semi-urban regions regarding the daily consumption of food with high-fat content. Average consumption of daily fat intake: Suburban areas: $1042,0 \pm 741,3$ Kcal/day. Urban: $872,89 \pm 606,58$ Kcal/day

Conclusions

Taking into account the adolescent students' residence appears to affect the dietary preferences of young people more than was previously thought which is an element that indicates the increasing westernization of young people's lifestyles. The huge need for nutritional knowledge improvement, healthy life promotion and modification of the dietary behaviour of the adolescent age group is still obvious and immediate

Poster Shift 1: Childhood & Adolescence

LONGITUDINAL VERSUS CROSS-SECTIONAL DATA TO ASSESS GROWTH CURVES OF POPULATIONS. APPLICATION TO THE ESTIMATION OF THE PUBERTY GROWTH PEAK

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Background and Aims

To assess growth curves of populations, collecting repeated longitudinal measurements per child (e.g. at 1 y interval) is more challenging than doing a cross-sectional study including people of all ages. We aimed to compare the weight growth curves of a pygmy population between birth and adulthood, estimated either using repeated growth measurements or using only one measure per child.

Methods

Weight was measured annually during an 8y time period in a Baka pygmy population of 0-27y males (n=258) and females (n=257). We used the Count-Gompertz growth function to model the growth curves separately in the populations of males and females (1) through a mixed-effect modelling approach on 90 randomly selected subjects with 3 measures on average and (2) through a fixed-effect model in the total sample, after randomly selecting one measure per subject. We re-sampled 50 times, and estimated mean and standard deviation of maximum weight growth velocity during puberty, and age at this peak.

Results

Estimate of weight growth velocity peak during the puberty period was underestimated by the cross-sectional data (in females, 3.56 ± 0.31 kg/year *versus* 4.29 ± 0.38 kg/year), as well as the estimated age at this peak (in females, 12.63 ± 0.36 years *versus* 12.94 ± 0.37 years). Uncertainty of these estimates was similar between both approaches. Comparable differences were observed in males.

Conclusions

These results show how crucial is the collection of repeated measurements for the study of weight growth curves. The number of measures and how the data should be distributed over time warrant further analyses.

Poster Shift 1: Childhood & Adolescence

A DIETITIAN EXPERIENCE REPORT AS PART OF A MULTIDISCIPLINARY TEAM IN BRAZILIAN PRIMARY HEALTH CHILDCARE

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Background and Aims

Considering the current obesity epidemic, the diffusion of knowledge and awareness about healthy eating habits has become a pressing demand for public health. This report describes the experience of a dietitian in the development of comprehensive approaches to the health of the children and adolescents when dealing with eating habits.

Methods

The comprehensive approaches were conducted by a resident dietitian as part of a multidisciplinary team in a primary health care institution in Campinas, state of Sao Paulo, Brazil. The team consisted of a dietitian, two nurses and a speech therapist, working with pediatricians in different fronts, including schools and a non-governmental organization during the year of 2016.

Results

The multidisciplinary teamwork promoted an intense knowledge and skills exchange and represented a valuable tool for enhancing the care provided for the children and their families. Activities involved medical appointments, presentations in health care fairs and schools, and special events such as the breastfeeding day celebration. These opportunities were used for evaluating eating and exercising habits and screening patients with chronic non-communicable degenerative disease, nutritional status, blood pressure and glucose levels. Recipes, healthy food choices and behavioral eating tips were shared with the population.

Conclusions

Healthy eating habits should be stimulated and valued in primary childhood and family care strategies, going from breastfeeding up to the full incorporation of healthy lifestyle habits. The activities played a very important role in the promotion of nutritional education and its importance in avoiding diseases.

Poster Shift 1: Childhood & Adolescence

CHARACTERISTICS AND CLINICAL OUTCOMES OF A HOLISTIC THERAPY FOR ANOREXIA NERVOSA ADOLESCENTS IN THAILAND

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Background and Aims

Currently, anorexia nervosa (AN) is increasing. The aim is to study characteristics and outcomes of anorexia nervosa in Thai adolescents in Siriraj Hospital.

Methods

Twelve adolescents (1 male and 11 female) diagnosed anorexia nervosa by DSM-IV criteria since 1998 to 2015 were recruited. Data consisted of the characteristics of patients, criteria for diagnosis anorexia nervosa, risk factors, treatments, outcomes, comorbidities and complications.

Results

Mean (\pm SD) age of the patients at diagnosis was 14.2 ± 0.7 years and mean (\pm SD) duration of diagnosis from weight loss existed was 8.1 ± 3.8 months. Monthly mean (\pm SD) weight loss was 2.1 ± 1.4 kg. Eleven out of 12 patients were restricting type of AN. They mainly had good educational score. Environmental factors influenced the pathogenesis in all patients and psychological factors affected in half of them. In terms of organic comorbidities, euthyroid sick syndrome, sinus bradycardia, iron deficient anemia, and vitamin D deficiency were commonly found. Serious complications such as acute renal failure, *Pneumocystis jiroveci* pneumonia with respiratory failure, hypocellular marrow, and intraventricular hemorrhage were present in a dead case. Most patients had psychiatric comorbidities such as depressive disorder and anxiety disorder. Holistic therapy consisted of nutritional support, management of organic complications, and psychological treatment. Seven patients normalized the core symptoms, including weight, menstruation, and eating behaviors, whereas one patient died from multisystem complications.

Conclusions

Anorexia nervosa can cause organic and psychological complications that need multidisciplinary team for treatment. Long-term follow-up is important for assessing recurrence and psychological complications.

Poster Shift 1: Childhood & Adolescence

COMPARISON OF GROWTH AND IRON STATUS IN CHILDREN CONSUMING ULTRA HIGH TEMPERATURE MILK AND GROWING-UP MILK: A QUASI-EXPERIMENTAL STUDY IN JAKARTA

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Background and Aims

Mothers often questioned what milk should be given to their children after 1 year of age, iron fortified growing up milk (GUM) or unfortified Ultra High Temperature (UHT) whole milk. With iron deficiency as high as 26% in underfive children of Jakarta and low intake of animal source protein there is a continuous concern that consuming UHT milk will lead to worsen iron status.

We wanted to see whether children that routinely consume UHT milk along with iron-rich food intake would have different growth and iron status compared to those who consume GUM.

Methods

A quasi-experimental study was conducted from May 2014 to February 2015. Healthy well-nourished non-anemic children aged 1-5 years old who had routinely consumed GUM or UHT milk were recruited purposively. We provided them their usual milk around 375-600 mL per day and encouraged them to consume red meat at least twice weekly. After 3 months, we compared weight gain, height increment, iron intake and iron status.

Results

181 subjects (91 of UHT and 90 of GUM) were recruited but only 161 completed the study. There were no significant differences in growth parameters. Lower iron intake and higher iron depletion were observed in UHT group, 6 g/day vs 10 g/day and 20.9% vs 10.1% respectively. Limit consumption to 500 mL/day of UHT milk was related to resolution of iron depletion in 3 subjects.

Conclusions

In well-nourished children with adequate intake of iron source, unfortified UHT milk results in similar growth parameters and no worsening of iron status.

Poster Shift 1: Childhood & Adolescence

THE ROLE OF MEAT PRODUCTS USED IN NOURISHMENT DURING PUBERTY TO PROVIDE THE INTAKE OF NECESSARY AMINO ACIDS

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Background and Aims

Amino acids are the base of proteins, which constitute a great part in our daily food intake and majorly reflect on human growth and development in the period of puberty. Essential amino acids cannot be produced in the body, and must be supplied by food. Thus, main protein source – meat - was chosen and applied for closer examination of the exact essential amino acid content in meat products.

Aims:

- Determine essential amino acid concentration in 4 types of meat - salmon, chicken, pork and beef
- Determine the necessary amount of essential amino acids in daily food intake for adolescents during puberty

Methods

1. Laboratory method is divided in 3 parts:

- Hydrolysis of 4 meat products, Rotor, Amino Acid Analyzer - Ion Exchange Chromatographic Method

2. Statistical analysis - SPSS programme

Results

Pork is the most valuable product to maximize the required essential amino acid intake, because of significant prevalence of histidine, threonine, leucine, lysine.

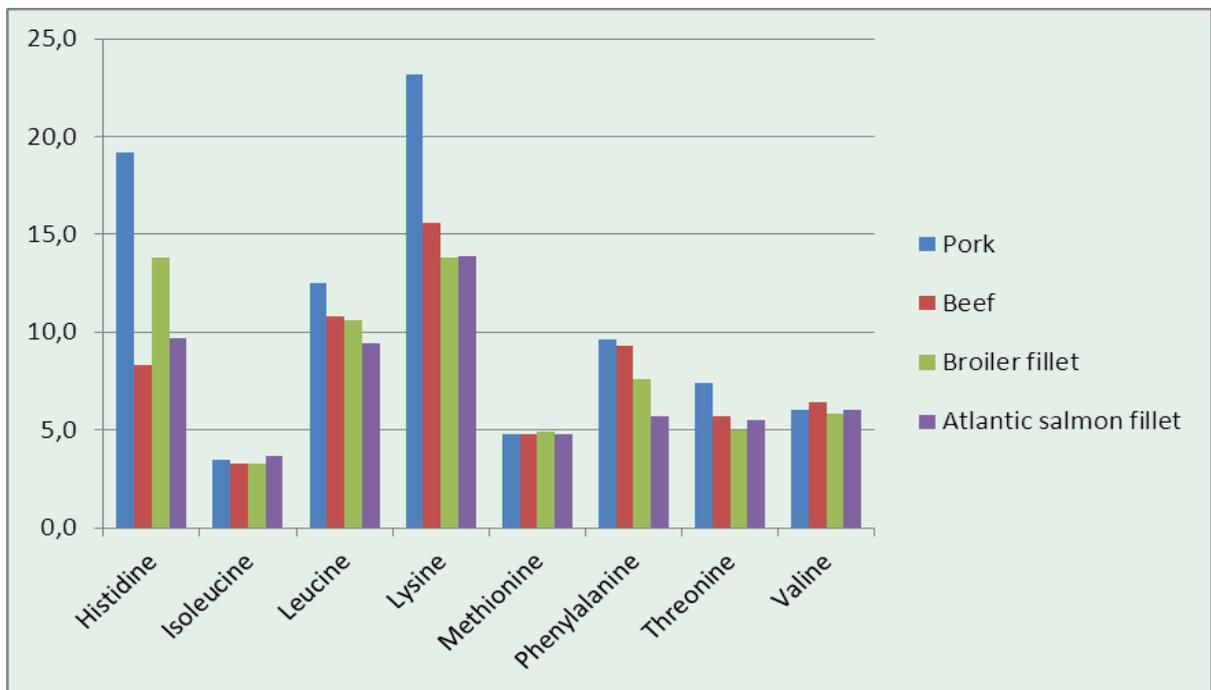


Figure 1. Essential amino acid composition of meat and fish patterns, mg/kg

Conclusions

1. Essential amino acids found in meat products help adolescents to grow and develop during puberty.
2. Pork has the greatest essential amino acid composition, therefore it has the greatest impact on a person's diet.
3. Broiler fillet is the second best to use in diet due to the amino acid composition.
4. Histidine, threonine, leucine, lysine are important for development, growth and rebuilding the muscle tissue, leucine and histidine for wound healing, lysine for calcium absorption and leucine for hormone production. Threonine is required for antibody production.

Poster Shift 1: Childhood & Adolescence

ASSESSMENT OF NUTRITIONAL STATUS OF SCHOOL CHILDREN IN KHARTOUM LOCALITY, KHARTOUM STATE, SUDAN

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Background and Aims

Childhood malnutrition is a known factor in reducing future productivity and vitality .It has been studied thoroughly in the under-five age group. The importance of the “catch up” period after the first five years of age and throughout adolescence has been identified in restoring normal body function.

The Objective is to assess the nutritional status of school children in Khartoum Locality and to verify socioeconomic status (SES) and gender as risk factors in determining the nutritional status of children.

Methods

A cross sectional school-based study. 390 children, males and females, were included aging between 5- 12 years (60 – 144 months) from private and public schools that differ in SES. Anthropometric measures were taken by standardized techniques and calibration and age was calculated in months. Using WHO's Anthroplus and SPSS, BMI for Age z-score (BAZ), Weight for Age z-score (WAZ) and Height for Age z-score (HAZ) were calculated and descriptive and analytical statistics were generated and tested.

Results

Among the 390 children, percentage of (BMI for Age z-score) severe thinness was 3.3%, thinness, 6.9%overweighing, 8.7%and the obese were 6.7% (P-value < 0.05). Children of public schools showed significantly lower scores compared to those of the private schools in all nutritional status indicators: thinness, underweight and stunting. Girls showed significantly higher nutritional scores compared to boys.

Conclusions

The overall nutritional status of the studied children was lower than of the WHO reference population. Significant association between nutritional status and gender and the type of school hence socioeconomic status. Further studies and interventions are recommended.

Poster Shift 1: Childhood & Adolescence

ANTHROPOMETRIC MEASUREMENTS AS A SIGNIFICANT TOOL FOR RISK ANALYSIS IN ASTHMA CLINICAL MANAGEMENT IN CHILDREN

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Background and Aims

Although great interest and vast resources are allocated, the studies on the association between obesity and asthma yield contradictory results, mainly because longitudinal studies are rare. Our aim was to evaluate if overweight/obesity and/or accelerated weight gain is correlated with asthma clinical outcome in children.

Methods

Longitudinal, non-interventional study in a cohort of patients attending a Regional Centre for Children with Asthma and Their Families. Nutritional status was assessed for a median of 4,1(+/-0,6) yrs at scheduled visits in asthmatic children (n=82, 46 boys). Multiple regression statistics were used to evaluate the correlations between anthropometric measurements and asthma clinical course. A customized childhood asthma control Questionnaire was used as a composite marker to assess asthma control, with values below 19 points defining the poor control.

Results

The increase of body mass index standard deviation score was significantly associated with low scores at the customized childhood asthma control Questionnaire (i.e. OR: 1,42; 95 % CI: 1,09-1,57; p=0,002), whereas neither body mass index at diagnosis, nor the number of exacerbations had a predictive value. Obesity in girls provided an almost two-fold decrease in scoring at the asthma control questionnaire (from 8,1 +/- 3,5 to 14,8 +/- 4,6) than in the obese boys group.

Conclusions

Data collected support the conclusion that accelerated weight gain is correlated with poor control in children with asthma. Larger cohorts of asthmatic paediatric patients with repeated measurements are required to consolidate this conclusion.

Poster Shift 1: Childhood & Adolescence

NUTRITIONAL STATUS OF CHILDREN REFERRED FOR STATURE CONCERNS

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¹*Singapore*

Background and Aims

Short stature is a common clinical concern and the assessment of short stature should always be done in conjunction with weight as nutrition is a key driver of height growth. This study aims to retrospectively review the weight status of children referred for stature concerns in KK Women's and Children's Hospital, Singapore.

Methods

A retrospective review of children aged 2 to 15 years referred for concerns regarding stature from Jan 2016 to Nov 2016 was carried out. These children were otherwise asymptomatic and referred by their parents, paediatrician or general practitioner for concerns regarding stature. Body mass index (BMI) for age percentiles were calculated using sex appropriate CDC BMI-for-age percentile growth charts.

Results

A total of 111 children aged 2 to 15 years were referred for concerns of short stature, with 80% having height <3rd percentile for age. Notably 25% were underweight with BMI for age <5th percentile. On the other hand, 10% of children had BMI for age >85th percentile, with half of these children having pathological cause for short stature.

Conclusions

Low weight for height is a significant contributory factor in patients presenting with stature concerns and is under recognized by parents as well as medical practitioners. This could be due to difficulty in interpreting the growth charts when both height and weight are <3rd percentile. This can be improved by increasing awareness of the use of BMI for age percentile growth charts. High weight for height is a strong indication of a likely underlying cause of short stature.

Poster Shift 1: Childhood & Adolescence

THE IMPACT OF EMERGENCY CASH TRANSFERS ON MALNUTRITION AND ITS RISK FACTORS AMONG INTERNALLY DISPLACED PERSON (IDP) CAMPS IN MOGADISHU, SOMALIA: THE REFANI-S STUDY

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Background and Aims

Humanitarian emergencies increasingly use cash transfer programmes. They are perceived as suitable interventions and an alternative to food aid. However, there is insufficient evidence of its nutritional impact.

Methods

The REFANI-S study is a DFID funded, non-randomised, cluster-controlled trial of the impact of emergency cash transfers on malnutrition risk factors in 20 IDP camps (clusters) in peri-urban Mogadishu. Half of the clusters were allocated to receive 85 USD monthly. Cross-sectional surveys were implemented in March and September 2016, to collect household, child, and mother/carer data on food security, wealth, infant and young child feeding practices (IYCF), nutritional status, and health. Additionally, a community surveillance system was established to assess the incidence of malnutrition. Here, we report results from the cross-sectional surveys.

Results

Figure 1 describes the survey samples. Baseline data (Table 1) indicates the study arms were comparable, although the intervention arm was, on average, wealthier with less dependants. GAM prevalence was (13.4% 95%CI: 9.42-18.7) at baseline. After a 6-month period (Table 2) households receiving cash showed significant improvements in expenditure and food security indicators. Food-dependent IYCF indicators and malnutrition prevalence did not show a corresponding improvement.

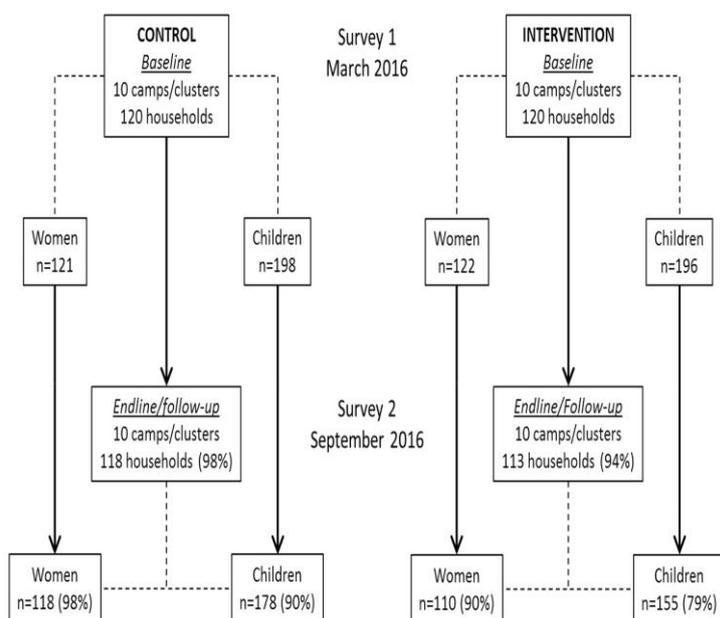


Figure 1. Participant flow

Table 1. Baseline characteristics.

	Control		Intervention		Difference Intervention <i>minus</i> control	
	mean	95% CI	mean	95% CI	mean	95% CI
Total household members	5.89	(5.25; 6.53)	6.13	(5.64; 6.62)	0.24	(-0.57; 1.04)
Household income in the last 30 days (USD)	57.2	(51.01; 63.3)	82.7	(62.4; 103)	25.5*	(4.24; 46.7)
Household expenditure in the last 30 days (USD)	79.7	(62.6; 96.7)	94.8	(71.2; 118)	15.1	(-14.0; 44.2)
Child dependency ratio	2.38	(2.11; 2.64)	1.90	(1.64; 2.16)	-0.48*	(-0.85; -0.11)
Women's age (years)	28.4	(26.8; 30.0)	29.0	(27.1; 30.9)	0.62	(-1.88; 3.13)
Women's height (cm)	158	(157; 159)	157	(156; 158)	-0.89	(-2.21; 0.43)
Children's age	29.6	(27.8; 31.3)	32.2	(29.9; 34.6)	2.65	(-0.28; 5.57)
Children's HAZ	-1.58	(-2.16; -1.01)	-2.18	(-2.67; -1.69)	-0.59	(-1.35; 0.16)
Children's WHZ	-0.73	(-0.94; -0.52)	-0.68	(-0.86; -0.49)	0.06	(-0.23; 0.34)
Children's MUAC	14.3	(14.1; 14.6)	14.2	(13.8; 14.6)	-0.14	(-0.60; 0.32)

* $p < 0.05$

Table 2. Differences in indicators and difference in differences.

	Control difference		Intervention difference		Difference in differences	
	endline <i>minus</i> baseline		endline <i>minus</i> baseline		Intervention <i>minus</i> control	
	mean	95% CI	mean	95% CI	mean	95% CI
Household food consumption score	10.9*	(4.88; 16.9)	25.7*	(17.7; 33.6)	14.8*	(4.83; 24.8)
Household dietary diversity score	0.57	(-0.11; 1.26)	1.57*	(0.98; 2.16)	0.99*	(0.09; 1.90)
Women dietary diversity score	0.47	(-0.02; 0.96)	1.84*	(1.16; 2.52)	1.37*	(0.53; 2.21)
Reduced coping strategy index	-1.71	(-4.30; 0.88)	-13.3*	(-18.3; -8.30)	-11.6*	(-17.2; -5.96)
Minimum dietary diversity (IYCF)	20.8*	(5.07; 36.6)	21.9*	(0.56; 43.2)	1.04	(-25.5; 27.6)
Minimum meal frequency (IYCF)	8.33	(-16.6; 33.2)	28.1	(-0.27; 56.5)	19.8	(-18.0; 57.6)
Minimum acceptable diet (IYCF)	6.25*	(0.15; 12.4)	15.6	(-4.97; 36.2)	9.38	(-12.1; 30.9)
GAM prevalence (WHZ < -2 and/or oedema)	-6.02	(-12.5; 0.43)	-3.38	(-10.0; 3.25)	2.65	(-6.61; 11.9)
Low MUAC prevalence (MUAC < 12.5cm and/or oedema)	-5.08*	(-9.15; -1.02)	-7.10*	(-13.5; -0.72)	-2.01	(-9.58; 5.56)

* $p < 0.05$

Conclusions

Emergency cash transfers programmes targeting IDP camps in Mogadishu improved food security but showed no effect on the prevalence of malnutrition. Further analysis using monthly surveillance data will assess the impact on malnutrition incidence.

Poster Shift 1: Childhood & Adolescence

CHILDHOOD OBESITY PREVALANCE AND RISK FACTORS IN TURKEY: A REVIEW

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Background and Aims

In 2013, 42 million infants and young children were overweight or obese. In Turkey, childhood and adolescent obesity is dramatically in increase. Obesity became a public health problem and the aim of the study is to investigate national risk factors and prevalences as a review.

Methods

We conducted literature search of the Google Scholar, Science Direct and PubMed database using 'childhood, adolescent, obesity, risk factors, prevalence, Turkey' keywords for papers published between 2000-2015. Studies were included if observational including cohort, randomized trial, cross-sectional, and case-control studies, had a measure of obesity using BMI, enrolled children aged from 0 to 18 years.

Results

Total obesity prevalence rates are 1.3%-10.6% (Female: 0.9%-11.7%, Male: 1.5%-12%). High-income family, living in a large city, having obese parents, being of high birthweight, irregular meal habits, low physical activity were identified as the most common risk factors. In two studies defined watching TV more than 2-3 hours per day as a risk factor. The other studies reported breastfed for less than 6 months, high birth weight, attending private school, as risk factors. And studies also shown that the obesity rates are higher in chocolate and chips consumer, less or inactive students, and the students under the maternal suppression for eating much.

Table 1:Prevalance and Risk factors

STUDY	YEAR	LOCATION	SAMPLE SIZE	AGE	OBESITY PREVALENCE	RISK FACTORS
Metinoğlu et al.(1)	2010	Kastamonu	480	10-12	T:1.3 F:0.9 M:1.5	Paternal obesity(p<0.02),low physical activity(p:0.032),happy emotional mood(p:0.032),maternal stress for eating much(p<0.01)
İnanç et al.(2)	2011	Mardin	3460	6-15	T:10.6 F:9.1 M:12	Paternal obesity(p<0.01),high socioeconomic status(p<0.01),eat irregular meals(p<0.05),watch TV more than 2 hours/per day(p:0.03),breastfed for less than 6 months(p<0.05),mothers' obesity(p<0.05)
Erçan et al.(3)	2011	Ankara	8846	11-18	T:7.7 F:8.4 M:7.0	Watching TV and using PC for more than 2 hours/per day,low physical activity
Yuca et al.(4)	2010	Van	9048	6-18	T:2.2 F:2.3 M:2.1	-
Dündar et.al(5)	2009	Samsun	2477	11-14	T:10.3	Gender,Boy(OR:1.557;95% CI:1.17-2.06),irregular meal habits(OR:1.84;95% CI:1.398-2.430),attending private school(OR:2.230;95% CI:1.384-3.593),sport(OR:0.9;95% CI:0.867-0.934)
Şimşek et al.(6)	2008	Bolu	6924	6-17	T:6.1 F:5.4 M:7.0	Gender,boys(p:0.04),living in urban areas(p<0.01),attending private school(p<0.01)
Sağlam et al.(7)	2008	Bursa	5368	6-12	T:7.0 F:11.7 M:8.5	Parent obesity,father or mother had higher education,father or mother were older,consumed more than 3 meals per day,consumed soda and juices more than 3 times per week,participated in sport activities less than 3 times per week,using elevator in everyday life,socioeconomic status was higher
Pirinçci et al.(8)	2007	Elazığ	3642	6-11	T:1.6 F:1.2 M:2.0	Eating while watching TV,eating fastfood

STUDY	YEAR	LOCATION	SAMPLE SIZE	AGE	OBESITY PREVALENCE	RISK FACTORS
Dişçigil et al.(9)	2005	Aydın	1348	6-16	T:3.71 F:3.66 M:3.7	High socioeconomic status
Krassas et al.(10)	2004	Kayseri	3703	6-17	T:1.6	-
Uçkun-Kitapçı et al.(11)	2004	Ankara	1647	10-16	T:3.6	Family history of DM, family history of obesity, low physical activity, high socioeconomic status
Kocoglu et al.(12)	2003	Sivas	2701	11-14	T:3.1	High income parents, high education, habitually rapid eating children, habitually swallow large pieces
Türkkahraman et al.(13)	2002	Antalya	2465	6-17	T:3.6 F:3.2 M:3.9	High birth weight, number of siblings, having computer at home, skipping breakfast, high socioeconomic status

Conclusions

School and family based factors are associated with an increased risk of childhood and adolescent obesity. Early and simple preventions and health promotion may decrease obesity in childhood.

Poster Shift 1: Childhood & Adolescence

PEDIATRIC-ONSET INFLAMMATORY BOWEL DISEASE POSES RISK FOR LOW BONE MINERAL DENSITY AT EARLY ADULTHOOD

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Background and Aims

Inflammatory bowel disease (IBD) is known to pose a risk for low bone mineral density (BMD) in children and adults. We aimed to evaluate the impact of pediatric-onset IBD on BMD in adulthood.

Methods

Records of patients who had documented dual-energy X-ray absorptiometry (DXA) scans after the age of peak bone mass accrual (females-18 years, males- 20 years) and were diagnosed with pediatric-IBD, were retrospectively reviewed. BMD was expressed as z-score and defined as the lower between lumbar and femoral-neck BMD for each patient.

Results

Sixty one patients with pediatric-onset IBD were included. Mean(\pm SD) age at diagnosis was 14.7(\pm 2.4) years. Mean age at first DXA scan in adulthood was 23.9 years (\pm 4.8). Median BMD z-score was -1.2 SD (IQR, -1.8 - -0.4), significantly lower than expected in normal population ($p < 0.001$). Overall, 44.3% ($n=27$) had osteopenia (BMD z-score ≤ -1 SD), and 8.2% ($n=5$) had osteoporosis (BMD z-score ≤ -2.5 SD). Bone-status showed no correlation with age, disease severity, height z-score, vitamin D status at diagnosis, IBD subtype or duration of disease. Positive correlation ($r=0.306$, $p=0.05$) was identified between low weight z-score at diagnosis and abnormal bone-status in adulthood. Thirty six patients had at least two DXA scans during follow-up. During a median interval of 2.4 years there was no significant change in BMD between first and last measurement.

Conclusions

Osteopenia and osteoporosis are frequent in adult IBD patients with pediatric-onset disease and correlates with low weight z-score at diagnosis. BMD does not significantly change over time in these patients.

Poster Shift 1: Childhood & Adolescence

ADVERSE LIPID PROFILES IN STUNTING TODDLER

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Background and Aims

Early nutritional stunting is associated with obesity and metabolic syndrome later in life. Stunted children metabolized lipids at a lower rate resulting in central fat mass gain and dyslipidemia. Few have studied lipid profiles in stunting children, but results were contradictory. We sought to determine the association between stunting and adverse lipid profiles in toddler.

Methods

We performed a cross sectional study and included toddler aged 1-3 years. We recorded demographic and anthropometric data. Lipid profiles were measured after 12 hours of fasting using standard method.

Results

We included 211 subjects in this study, 99 of them were stunted (height-for-age z score <-2 according to WHO 2006 standards). Majority were girls (52.1%) with mean age 23.6 ± 6.6 months. Respectively, mean weight-for-age z score and weight-for-height z score are -1.51 ± 1.07 and -0.9 ± 1.02 . Stunted children had lower triceps skinfold thickness (mean differences 0.89 ± 0.32 mm (95%CI 0.26 to 1.53), nevertheless there were no differences in body mass index between the two groups. Children who were stunted had higher triglycerides (TG) level compared to non-stunted children (mean differences 16.83 ± 7.1 (95% CI 2.85 to 30.83), but no differences were observed in total cholesterol, HDL-cholesterol, and LDL-cholesterol between the two groups. Stunted children younger than 2 years-old had higher TG level compared to older stunted children (mean differences 24.21 ± 11.05 (95%CI 1.37 to 47.04).

Conclusions

Nutritional stunting early in life appears to be associated with lower body mass and altered lipid profile as early as second year of life.

Poster Shift 1: Childhood & Adolescence

VITAMIN D DEFICIENCY/INSUFFICIENCY- FROM CHILDHOOD TO ADULTHOOD: INSIGHTS FROM A SUNNY COUNTRY

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Background and Aims

Vitamin D is known to be a key regulator of bone metabolism and is associated with muscle strength.

Vitamin D deficiency is widely prevalent worldwide. In adults, vitamin D deficiency has been implicated in numerous health conditions including osteoporosis, cancer, diabetes, and autoimmune diseases.

Considerable changes have occurred in lifestyles and childhood activities in the past years. Studies have shown that the children population is at high risks of vitamin D deficiency.

Objectives

The objective of this study was to learn about the extent of vitamin D deficiency in children worldwide and especially in sunny country like Israel.

Settings

In this review we surveyed the extent and severity of vitamin d deficiency worldwide and especially in Israel, through a very comprehensive review of previous reports and research studies done during the last years.

Results

We found reports on vitamin D deficiency in children, which was associated with metabolic syndromes and obesity. It was more prevalent in children who spend less time on outdoor activities, in obese children, and in cases when there was imbalance between nutritional intakes and requirements. Vitamin D deficiency is common even in children living in sunny places like Israel.

Conclusions

The doctors should be aware of the fact that although vitamin D deficiency is prevalent in the elderly population, it can also appear in the children, and can be associated with different illnesses.

We encourage supplementation of vitamin D to special populations (pregnant and lactating women, infants, and high risk groups). We also encourage implementation of international food fortification programs.

Poster Shift 1: Childhood & Adolescence

UPSTREAM VISION OF CUES-TO-ACTION FOR NUTRITION AND PHYSICAL ACTIVITY PROMOTION AMONG YOUTH: MOVING FROM RESEARCH TO ACTION?

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Background and Aims

Nutrition and physical activity promotion strategies help youth make sound nutrition decisions and effectively manage their healthy lifestyle. Selecting the appropriate communication channels with youth and establishing the parameters of use require consideration of several factors.

To (i) explore which factors act as mediators between nutrition promotion strategies and youth compliance and (ii) identify possible opportunities for nutrition communication to support youth in adapting healthy lifestyles in Lebanon.

Methods

A qualitative method was selected for an in-depth exploration of the cues- to-action to promote nutrition and physical activity among youth. An exhaustive integrated conceptual framework based on social marketing approach and using several theories and models was developed and used. 35 adults and 48 youth from 8 private and public schools from different geographical areas participated in this study.

Directed and semi-structured individual interviews were conducted with school directors, responsible of school food services and youth. Focus groups were conducted with parents and teachers. Both individual interviews and focus groups were audio-recorded and analyzed using a thematic qualitative analysis.

Results

Innovative interactive methods and real life examples emphasizing the healthy beautiful body image are identified as the most cues-to-action to promote nutrition among youth. Youth and their communities will endorse nutrition promotion strategies that promote their culture. Applied activities, mass and social media are best communication channels to be used in different settings to promote healthy lifestyle patterns.

Conclusions

Combination and mutually supportive communication channels, and sociocultural-based strategies are likely to be the most effective mediators to promote nutrition and physical activity among youth.

Poster Shift 1: Childhood & Adolescence

PICKY EATING BEHAVIOR OF CHILDREN'S: PARENTS PERCEPTIONS

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Background and Aims

Picky Eating classified as part of a spectrum of feeding difficulties and recognized as a normal development in preschool children; it is characterized by an unwillingness to eat familiar foods or to try new foods, as well as consuming a limited type and amount of foods. It may cause serious concern for the parents and associated with eating disorders in adolescent and early childhood. The aim of our study is to explore the perceptions of parents on picky eating behavior and feeding practice.

Methods

Cross sectional survey conducted among parents visiting general pediatrics clinics at Hamad Medical Corporation, the main tertiary teaching hospital in Qatar. Questionnaire designed was to include details of demographics, child's eating habits, perceived health status and parents attitudes towards picky eating.

Results

A total of (136) questionnaire were analyzed; among the children, a mean age of 5 years old. (75%) of mothers were responsible for feeding and scheduling meals. Almost (60 %) of parents stated that they are considering their children as picky eater and have a concerns about their growth, poor appetite and not getting optimal vitamins from meals .The most common behaviours of a picky eater among the group responding included; (60%) eating slowly, refusing food and prefer liquid over solid, (50%) avoiding new foods, (45%) refuse to eat at the mealtime.

Conclusions

Majority of parents in our study considering their children as picky eater, better understanding family dynamics and mealtime interactions will help in improving parenting feeding styles and decrease negative parent-child interactions.

Poster Shift 1: Childhood & Adolescence

PERCEPTION AND ALTITUDE TOWARD CHILDREN EATING BEHAVIOR AMONG FAMILIES AND PHYSICIANS IN PEDIATRIC OUT PATIENTS CLINICS IN QATAR

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Background and Aims

Eating behavior in children is considered part of their growth and development, One those behavior is picky eater . There is no single widely accepted definition of picky eating. Our aim from this study is to explore the perception of picky eater concept in the community among parents and physicians.

Methods

Cross sectional single institution retrospective study was done at Hamad Medical Corporation in out patients pediatric clinics. Survey include details of demographic ,several questions to explore the perception of picky eater among parents and physicians .

Results

analysis of 136 survey from both side parents and physicians had show sharing of same concern about children growth but family concern was higher(58%) compering to physicians concern (43%) p value (0.05).family concern was matching low body mass index for their kids where the BMI was <15 (72%) p value (0.016).while doctors concern was less compering to BMI of the children (50%) p value(0.17).also family showed superiority on the physicians in the point of considering their children as picky eater as about (57%) from parents ,while only (40%) from physicians with p value(0.006).

Both side shared almost similarity in concern regarding picky eater behaviors importantly refusal to eat at meal time parents (44%) and physicians(21%) p (0.001)

Conclusions

Family concern should be taking in consideration all the time in evaluation of eating behavior in children, understanding of children eating behaviors will represent a great area to work on as it will open new doors for communication and collaboration between community and physicians.

Poster Shift 1: Childhood & Adolescence

DIETARY BEHAVIOUR OF NEET-YOUTH IN VIENNA AND LOWER AUSTRIA

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Background and Aims

Young people Not in Education, Employment or Training (NEET) represent a socioeconomically disadvantaged group. 15.4% of all young Europeans belong to this vulnerable group. Little is known about their dietary behaviour. The WHO-HBSC-Surveys showed poor eating behaviour among adolescents with low socioeconomic status. Therefore, the project GAAS targets on analysing and improving dietary behaviour among NEET-youth.

Methods

Questionnaires focusing on dietary behaviour were part of the needs analysis within the GAAS-project. 53 NEET-youth (32 male; 21 female), recruited via youth organisations in Vienna and Lower Austria, with an average age of 17.9±1.7years participated in the survey. Outcomes are compared with the Austrian results of the WHO-HBSC-Survey 2014 (Ramelow et al., 2015).

Results

70% lived in a family with low/middle affluence (HBSC: 56.1-67.0% high affluence) and 55% had an immigration background (HBSC: 10.9-14.3%). Results showed unfavourable eating habits among NEET-youth compared with HBSC-data. Participants mentioned a lower daily consumption of fruit (GAAS: 26.4%; HBSC: 43.8%), a higher everyday intake of fast food (GAAS: 9.4%; HBSC: 4%) and soft drinks (GAAS: 38.5%; HBSC: 17.5%). Moreover, 28.3% of the interviewees consumed energy drinks daily. However, NEET-youth reported to eat less sweets than HBSC-average (GAAS: 20.8%; HBSC: 27.9%) and a comparable amount of vegetables (GAAS: 28.3%; HBSC: 30.6%).

Conclusions

The project GAAS collected unique data concerning dietary behaviour of NEET-youth. Most of the participants had a poor eating behaviour. Especially the high consumption of soft/energy drinks is a matter of concern. These results underline adverse interrelations of socioeconomic disadvantages and health already in younger people.

Poster Shift 1: Childhood & Adolescence

EFFECT OF PARENTAL EDUCATION ON NUTRITIONAL STATUS OF SCHOOL GOING CHILDREN FROM IRAN AND INDIA

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Background and Aims

Parental literacy on childhood nutritional status may be due to knowledge regarding child malnutrition, growth and better food choices. The aim of this study is determinant of parental education on school children's nutritional status from selected urban areas of Iran and India.

Methods

Four thousand five hundred and seventy children aged 6-9 years old constituted the sample. From these, 2234 Iranian and 2336 Indian school children were included in a cross sectional study. Educational status of both parents was recorded by an interview with mothers of children. Height and Weight of children were taken and body mass index were calculated. The World Health Organization's (WHO) AnthroPlus software used to assess the nutritional status of the children.

Results

Parental education was associated with weight for age z-scores in both countries. In India a higher percentage of children of less educated parents i.e. those who were either illiterate or who could read and write had smaller stature i.e. were moderately stunted. However, in Iran 16 percent of the moderately stunted children's mothers had a Master's degree. When the z-scores for weight for height were examined, it was observed some children who were moderately wasted in both countries had mothers with postgraduate education. No significant difference in BMI of Indian children and father's education in India ($\chi^2=13.003$ $p=0.602$) in Iran it was clearly significant. ($\chi^2=99.081$, $p=0.000$).

Conclusions

The present study confirms the observations of other studies that show higher levels of under nutrition in children 6-9 years from families with low parental education.

Poster Shift 1: Childhood & Adolescence

BREAKFAST EATING PATTERN ASSOCIATED WITH NUTRITIONAL STATUS AMONG URBAN PRIMARY SCHOOLCHILDREN

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Background and Aims

The aim of this study was to examine the effect of breakfast eating pattern (Between frequencies of breakfast consumers and non-consumers) on nutritional status (Weight for Age, Height for Age and Weight for Height).

Methods

A total 4570 primary school children aged 6-9 years old constituted the sample. From these, 2234 Iranian school children (1218 girls and 1016 boys) and 2336 Indian school children (1096 girls and 1240 boys) were included in a cross sectional study. Breakfast frequency consumption was recorded through an interview with mothers of children. Height and Weight of children were taken and body mass index were calculated. The World Health Organization's (WHO) AnthroPlus software used to assess the nutritional status of the children.

Results

Weight for age z-scores were slightly associated with frequency of consuming breakfast in both India ($\chi^2 = 60.083$, $p=0.000$) and Iran ($\chi^2 = 18.267$, $p=0.032$). A significant association was seen between frequency of child's breakfast intake and the height z-scores in both India ($\chi^2 = 31.334$, $p=0.000$) and Iran ($\chi^2 = 19.443$, $p=0.022$). Most of children with normal height had breakfast daily in both countries. A significant association was seen with children's BMI z-scores of Indian children ($\chi^2 = 31.247$, $p=0.000$) but it was not significant in Iran ($\chi^2 = 10.791$, $p=0.095$).

Conclusions

The present study confirms the observations of other studies that showed more frequency in having breakfast is associated with better nutritional status.

Poster Shift 1: Childhood & Adolescence

MTR A2756G GENOTYPE INFLUENCES THE EFFECTS OF DIETARY PROTEIN ON OXIDIZED LOW-DENSITY LIPOPROTEIN IN BRAZILIAN ADOLESCENTS

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Background and Aims

Vitamin B12 and folate deficiencies have been shown to be associated with changes in the expression of genes involved in lipid metabolism. Hence, we examined the association of sixteen vitamin B12- and folate-related single nucleotide polymorphisms (SNPs) with blood lipids [high- (HDL), low- (LDL) density lipoproteins, triacylglycerol (TAG) and oxidized-LDL (ox-LDL)] and investigated whether diet modified the association of SNPs with blood lipids.

Methods

The study population included 115 adolescents with overweight or obesity and/or previously diagnosed dyslipidemia, but not with CVD. Genotyping was performed by real-time polymerase chain reaction. Biochemical analysis was performed by classical methods, and food consumption analysis was performed by usual food intake. Linear regression was used to examine the associated effects of the SNPs and dietary factors with lipid concentrations.

Results

The SNP rs1801394 at 5-methyltetrahydrofolate-homocysteine methyltransferase reductase (*MTRR*) gene and SNP rs769224 at catechol-O-methyltransferase (*COMT*) gene were associated with TAG concentrations ($P=0.01$ and 0.004 , respectively); however, these associations were not statistically significant after Bonferroni correction. In the interaction analysis, the 5-methyltetrahydrofolate-homocysteine methyltransferase (*MTR*) gene SNP, rs1805087 (A/G), alone showed a significant interaction with protein (energy %) on ox-LDL concentrations ($P_{\text{interaction}} = 0.0001$) after correction for multiple testing.

Conclusions

Our study provides evidence for a novel interaction between SNP rs1805087 at *MTR* gene and protein intake on ox-LDL levels in adolescents, where AA homozygotes are likely to have higher ox-LDL levels than the G allele carriers in response to a high protein diet.

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Poster Shift 1: Childhood & Adolescence

NUTRITIONAL STATUS OF CHILEAN ADOLESCENTS BY THE UNIVERSITY SELECTION TEST (PSU) ACHIEVEMENT AND GENDER

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Background and Aims

Nutritional status has been described as an important predictor of scholastic achievement (SA). The aim of this study was to describe the nutritional status of Chilean adolescents on the results of the 2013 PSU tests of language (LA) and mathematics (MA) by gender.

Methods

A representative sample of 671 school-age children of both sexes, from high, medium and low socioeconomic strata, graduated from high school during 2013 and took the PSU tests of LA and MA, for university admission. PSU scores were grouped as follows: High PSUSA (> 620) and Low PSUSA (< 450) in both tests. Nutritional status was assessed by means of prenatal (birth weight, birth length and breastfeeding), postnatal (height-for-age Z-score, Z-H and head circumference-for-age Z-score, Z-HC) and current nutritional status (body mass index Z-score, Z-BMI) measurements. Data were processed using the Statistical Analysis System package.

Results

Females with Low PSUSA exhibited the lowest values for Z-HC compared with males and, with females and males with High PSUSA ($F= 19.75$, $P< 0.0001$) and for Z-H, only when compared with males with High PSUSA ($F= 8.46$, $P< 0.0001$). Prenatal and current nutritional status did not associate with PSU outcomes.

Conclusions

Conclusions: Females from the Low PSUSA group obtained the lowest PSU scores, Z-HC and Z-H values. Z-HC the anthropometric index of both nutritional background and brain development is a good predictor of PSU results. These findings may be useful for health and educational planning in Chile and countries in a comparable stage of development.

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Poster Shift 1: Childhood & Adolescence

CONSUMPTION OF NUTRITIONALLY ENHANCED FOODS AND NUTRITIONAL SUPPLEMENTS AMONG FEMALE HIGH SCHOOL LONG-DISTANCE RUNNERS IN JAPAN

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Background and Aims

Ingestion of nutrients for the purpose of preventing injury and enhancing physical strength is an important issue for persons engaged in sports. The purpose of this study is to determine the consumption status of nutritionally enhanced foods and nutritional supplements among female high school long-distance runners and assess the need for ingestion of these products.

Methods

A survey of nutrition and diet along with physical measurements, body composition (DXA), blood tests and urinalysis were conducted in 2016 on 12 female high school long-distance runners residing in XX prefecture in Japan after acquiring their consent.

Results

Seven of the subjects consumed nutritionally enhanced foods while five did not, and there were no significant differences between the two groups with respect to physical measurements or body composition. Significant differences were observed with respect to energy and 10 other types of nutrients equivalent levels between the consumption group and the non-consumption group. Although a significant difference was not observed between the consumption ($2444 \pm 612 \mu\text{g}$) and non-consumption groups ($2226 \pm 747 \mu\text{g}$) with respect to retinol equivalent levels, indicating excessive intake equal to 362% of the recommended dietary allowance. All nutrient levels other than energy were consumed in excess of the reference values.

Conclusions

The consumption of nutritionally enhanced foods and nutritional supplements was suggested to have the potential to lead to excessive ingestion of various nutrients such as vitamin A. It will therefore be necessary to provide proper guidance in order to prevent potential health hazards attributable to excessive nutrient intake.

Poster Shift 1: Childhood & Adolescence

QUALITY OF LIFE AND DIET QUALITY ARE INTERRELATED IN PEDIATRIC PATIENTS WITH FOOD ALLERGY

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Background and Aims

Background: Covering nutritional needs and achieving normal growth while adhering to elimination diets may be challenging for children.

Aim: To assess quality of life (QoL) and diet in pediatric patients with food allergy. **Methods**

Seventy two patients (23 boys), aged 3-14 years old (median=6.39 years) were assessed. Anthropometry, food records and Diet Quality Index-International (DQI-I) were performed by a dietitian. QoL was assessed using validated Food Allergy-Specific Questionnaires for QoL both parental and children forms

Results

Multiple food allergies were diagnosed in 50%. Mean Waz was 0.18 ± 1.26 (6.3% underweight). Mean BMIz was 0.29 ± 1.3 . (23.6% overweight). Mean DQI-I score was 52.33 ± 8.81 . Average intake to requirements ratio was 80%, but lower coverage was observed in children with poor DQI-I ($p < 0.05$). According to analysis of the "adequacy" component of DQI I, just 28% and 30% of the patients cover the RDI for iron and calcium respectively. Mean intakes of Vit D and E represent just 28% and 14% of the RDI's respectively. Patients with poor and medium diet quality reported more stress when consuming food or potential allergens ($p < 0.05$). Parents of both overweight and underweight children were less aware of potential restrictions of food allergy at school, compared to parents of normal weight ones ($p < 0.05$).

Conclusions

In pediatric patients QoL and diet quality are interrelated. Our findings concerning the inadequate intake of specific nutrients, suggest that pediatric food allergy patients could possibly benefit from a food allergy-specific diet quality index that could be more effective in highlighting their diet quality issues.

Poster Shift 1: Childhood & Adolescence

MELATONIN SUPPLEMENTATION COULD EFFECT IN RITALIN TREATED CHILDREN SUFFERING FROM ADHD

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Background and Aims

ADHD is the most common behavioral disorder in children and mostly it is integrated with sleep disorders. It is postulated that ADHD children are from sleep latency due to defects in circadian cycle. Furthermore Ritalin, the most useful drug to cure these children. Worsens the insomnia as a common side effect. According to safety and applicability of melatonin supplementation studies we decided to evaluate its effects in Ritalin treated children suffering from ADHD.

Methods

After obtaining consent from the parents, 60 children aged 7-12 with compound form of AD/HD, randomly divided in to two groups based on gender blocks, one receiving melatonin (3 or 6 mg based on weight) combined with Ritalin (1mg/kg) and the other placebo combined with Ritalin (1mg/kg) in a double blind randomized clinical trial. In weeks 0, 2, 4 and 8, hyperactivity- attention and sleep patterns questionnaires were completed and finally hypotheses were analyzed using the software SPSS17.

Results

Fifty subjects completed the study. ANOVA with repeated measures did not show any significant differences in the mean scores of hyperactivity and attention deficiency in the melatonin group compared with the placebo group. Mean sleep latency and total sleep disturbance score was reduced and sleep duration was increased in melatonin group but it this reduction was not significant comparing with placebo group.

Conclusions

Eight week administration of melatonin along with Ritalin cannot significantly improve symptoms of hyperactivity and attention deficiency in ADHD children who are not sleep deprived base line. But it may partially improve sleep disturbances.

Poster Shift 1: Childhood & Adolescence

DOES ATTENDANCE AT A PAEDIATRIC MULTIDISCIPLINARY SPECIALIST BARDET-BIEDL SYNDROME ANNUAL REVIEW CLINIC LEAD TO A REDUCTION IN BODY MASS INDEX?

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Background and Aims

Early obesity is a major clinical feature of Bardet-Biedl syndrome¹ (BBS). Associated hyperphagia makes weight control challenging. Specialist dietetic support is provided as part of this national service. This review aims to assess the impact of clinic attendance on BMI z-score.

Methods

Between April 2010 and September 2016 92 children with BBS (genetic confirmation/clinical diagnosis) were seen at paediatric/transition clinic appointments (mean interval 1.56 years). LMS-Growth calculated BMI z-score (1990 UK reference data) were derived from height and weight measurements and clinical obesity classifications applied. Individual BMI z-score change -0.05 to +0.05 was considered maintenance. Exclusion criteria were: baseline age <2 years, BMI z-score <1.33, missing/inaccurate/single measurement (n=37).

Results

55 children (3-16 years) were included (mean BMI z-score 3.12, SD1.1, range 1.33-6.3). At baseline 7 (13%) were overweight, 15 (27%) obese and 33 (60%) severely obese. BMI z-score reduction at initial review was achieved by 25/36 (69%) children aged <12 years at first appointment and 8/19 (42%) >12 years. Mean reduction in BMI z-score at first review (n=55) was -0.18 (SD 0.51, $p=0.01388$), second (n=39) -0.51 (SD 0.66, $p=0.00002$) and third (n=20) -0.57 (SD 0.87, $p=0.00888$).

Conclusions

BMI z-score reduction is significantly associated with clinic attendance. Improved outcomes are associated with younger age. Early referral to the specialist national paediatric multidisciplinary BBS service is advocated to optimise weight management strategies.

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Poster Shift 1: Childhood & Adolescence

ASSOCIATION BETWEEN SERUM FERRITIN AND HEMOGLOBIN LEVELS AND BONE HEALTH IN KOREAN ADOLESCENTS

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Background and Aims

It is important to identify risk factors for low bone mass at a young age. An influence of iron store on bone health in the general population has been reported but has not been studied in adolescents. This study aimed to investigate the relationship between hemoglobin and serum ferritin levels and bone mineral content (BMC) in South Korean adolescents.

Methods

This study was based on data collected during the 2009–2010 Korea National Health and Nutrition Examination Survey. We included 1321 subjects aged 10 to 18 years. BMC was measured at the femur and lumbar spine by dual-energy x-ray absorptiometry, and hemoglobin and serum ferritin levels were examined.

Results

In boys, hemoglobin and serum ferritin levels were positively associated with BMC at total femur and lumbar spine after adjusting for confounders, and hemoglobin levels significantly increased as BMC increased at all sites (p for trend = 0.001 for total femur, 0.01 for femur neck, and < 0.001 for lumbar spine). Likewise, serum ferritin levels showed increasing trends according to increasing BMC of total femur and lumbar spine in boys (p for trend = 0.04 for total femur; and < 0.001 for lumbar spine). However, these associations were not observed in girls.

Conclusions

This study suggests a positive relationship between serum ferritin and hemoglobin levels and BMC in South Korean adolescent boys.

Poster Shift 1: Childhood & Adolescence

EFFECTS OF ASTRAGALUS EXTRACT MIXTURE ON HEIGHT GROWTH IN CHILDREN WITH MILD SHORT STATURE: A MULTICENTER, DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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Background and Aims

Astragalus extract mixture, containing *Astragalus membranaceus* and *Phlomis umbrosa* roots and *Eleutherococcus senticosus* stem, enhances longitudinal bone growth in short- and long-term *in vivo* models by stimulating cell proliferation in the epiphyseal plate and inducing the expression of insulin-like growth factor-1 (IGF-1) without estrogenic response. We evaluated the safety and efficacy of Astragalus extract mixture on height growth in prepubertal children with mild short stature.

Methods

A multicenter, randomized, double-blind, placebo-controlled study was performed over 24 weeks on Korean children aged 6–8 years with height ranked below the 25th percentile for their age and gender according to the Korean population-based reference growth chart. The children were randomly assigned supplementation with either a placebo or Astragalus extract mixture. We compared changes in height, bone age, and serum hormone levels between the placebo and Astragalus extract mixture groups.

Results

In children, whose height was measured at baseline and end point, height gain was significantly higher in the Astragalus extract mixture group than in the placebo group after 24 weeks. This difference was elevated when the efficacy analysis was restricted to children whose height was less than the 10th percentile at baseline. Bone age advanced in both groups, but the advance was lower in the Astragalus extract mixture group. Serum IGF-1 and IGFBP-3 levels were significantly increased compared with baseline only within the Astragalus extract mixture group.

Conclusions

Astragalus extract mixture increased height growth without skeletal maturation, demonstrating that Astragalus extract mixture could offer an effective treatment to increase height in children with mild short stature.

Poster Shift 1: Childhood & Adolescence

WHICH DIET-RELATED BEHAVIORS IN CHILDHOOD INFLUENCE A HEALTHIER DIETARY PATTERN? FROM THE EWHA BIRTH & GROWTH COHORT

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Background and Aims

This study was performed to examine how childhood dietary patterns change over the short term and which changes in diet-related behaviors influence later changes in individual dietary patterns.

Methods

Using food frequency questionnaire data obtained at 7 and 9 years old from the Ewha Birth & Growth Cohort, we examined dietary patterns by principal component analysis. We calculated the individual changes in dietary pattern scores. Changes in dietary habits such as eating a variety of food over 2 years were defined as “improving,” “stable,” or “worsening”.

Results

The dietary patterns, labeled as “healthy intake,” “animal food intake,” and “snack intake,” were similar at 7 and 9 years old. Eating a variety of food at 7 years old was consistently associated with healthy intake at each follow-up. Eating vegetables with every meal was also negatively associated with snack intake. Intra-individual stability of dietary habits ranged from 0.23 to 0.47 based on sex-adjusted weighted kappa. Moreover, the changes in behaviors regarding eating a variety of food and eating vegetables with every meal showed favorable effects on changes in healthy dietary pattern scores.

Conclusions

Our results suggest that diet-related behaviors can change, even over a short period, and these changes can affect changes in dietary pattern.

Poster Shift 1: Childhood & Adolescence

CHILDREN'S ANTHROPOMETRIC PROFILE FROM SEMI-URBAN AND URBAN AREAS AND PARENT'S KNOWLEDGE ABOUT NUTRITION

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Background and Aims

Childhood is a stage of life in which occur several learning processes, and caregivers have a key role in transmitting knowledge to them, particularly in terms of food choices, which persist into adulthood. It is necessary to understand whether attitudes and nutrition knowledge by caregivers can influence children in healthier food choices.

This study aims determine the influence of nutritional knowledge of caregivers in inadequacy of the anthropometric profile of children, as well as the influence of the residence area in this relationship.

Methods

A cross-sectional study was conducted in 92 children aged between 3 and 10 years old, living in two different areas (urban / semi-urban). Anthropometric measurements were collected (weight, height and waist circumference). Caregivers answered to Questionnaire of Nutritional Knowledge. Statistical analysis was conducted using SPSS. A cut-off of 5% was used.

Results

It was observed a higher percentage of obesity (22,0% vs 3,9%; $p = 0,057$) and abdominal obesity (34,1% vs 7,8%; $p = 0,002$) in semi-rural area. However, no differences were found between Body Mass Index (BMI) and residence area, as well as the level of knowledge in nutrition of their parents and the child's BMI.

On the other hand, school level of the parents seems to affect positively the level of knowledge about nutrition.

Conclusions

Children from semi-rural area seems to have a more inadequate anthropometric profile and school level of the parents seem to affect their nutrition knowledge. This nutrition knowledge seems that doesn't affect the nutritional profile of the children.

Poster Shift 1: Childhood & Adolescence

AIR DISPLACEMENT PLETHYSMOGRAPHY FOR ASSESSMENT OF BODY COMPOSITION IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE

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Background and Aims

Growth impairment is commonly seen in children with inflammatory bowel diseases (IBD). It's known that body composition, is altered in children with IBD compared with controls. Data on the usefulness of air displacement plethysmography (ADP) for assessing body composition has not been studied in IBD. Thus, we aimed to assess body composition in children with IBD by ADP in comparison to DXA.

Methods

In a retrospective cohort study, we measured body composition in children (6-18 years) with diagnosed IBD using both ADP (Cosmed, Italy) and DXA (Lunar Prodigy Primo, US). The two measurements were performed no longer than 2 weeks apart. Anthropometric and clinical parameters were recorded at the time of the first measurement.

Results

Forty children, 12 with ulcerative colitis and 28 with Crohn's disease, were evaluated (median age 14.2 (IQR 11.6-15.55 years), females 14 (35%). Median duration from diagnosis was 1 year (IQR 0.25-2.4 years). BMI z-scores -0.42 ± 1.25 correlated positively with DXA (Spearman's $r=0.511$, $P=0.001$) and ADP (Spearman's $r=0.55$, $P<0.0001$). Mean body fat (%) was estimated as 16.47 ± 10 and 26.34 ± 7.45 for ADP and the DXA, respectively. Median percentile of fat mass index (FMI) was 25 (IQR 6.2-50). There was a fair correlation between two measurements (Spearman's $r=0.796$, $P<0.0001$). A significant difference was demonstrated between ADP and DXA ($P<0.0001$).

Conclusions

ADP is a reliable method for the assessment of body composition in pediatric IBD patients. Although the two methods were highly correlated, ADP measurements yield significantly lower scores when compared to DXA. These findings are compatible with data demonstrated for other diseases.

Poster Shift 1: Childhood & Adolescence

THE CORRELATION BETWEEN IL-6 572 G/C GENE POLYMORPHISMS AND CLINICAL, ENDOSCOPIC AND HISTOLOGICAL CHANGES IN CHILD'S HELICOBACTER PYLORI GASTRITIS

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Background and Aims

Infection with *Helicobacter pylori* (H pylori) is one of the most worldwide spread infections. It is acquired in the first years of life in both developed and developing countries. Genetic polymorphisms of several inflammatory and immunoregulatory cytokines are investigated for their possible association with the risk for specific H pylori-associated disease.

The aim of our study was to investigate the correlation between *IL-6 572 G/C* and clinical, endoscopic and histological changes in children's gastritis.

Methods

We did a prospective study on 98 children (47 children with *Helicobacter Pylori* infection and 51 without *Helicobacter Pylori* infection) aged between 5 and 18 years admitted in a Pediatrics Tertiary Hospital from Romania, assessing them clinically, endoscopically, histopathologically, and genetically.

Results

In our study we found that the presence of GC+CC genotype of *IL-6 572 G/C* was correlated with vomiting ($p = 0.025$) in children with H. pylori infection, likewise the 'paving-stone' aspect of the mucosa ($p = 0.03$, OR=0.18, 95% CI: [0.017-0.85]). Also, allele G of *IL-6 572 G/C* polymorphism ($p = 0.01$) were associated with *Helicobacter Pylori* infection. The variant genotype of *IL-6 572 G/C* in the control group was associated with abdominal pain and also with epigastric pain ($p = p=0.02$, and $p = 0.05$).

Conclusions

. *IL-6 572 G/C* gene polymorphisms present a great impact on H Pylori gastritis in children, therefore further studies are needed on this topic.

Poster Shift 1: Childhood & Adolescence

PARTICIPATION IN FOOD-RELATED DAILY ACTIVITIES: PROMOTING SELF-MANAGEMENT AMONG CHILDREN AND ADOLESCENTS WITH CELIAC DISEASE

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Background and Aims

Adherence to the restrictive and sole treatment for Celiac disease (CD) entailing a gluten free diet is challenging. Children and adolescents experience a wide range of restrictions in participating in daily food-related activities. Participation is a central component of the International Classification of Functioning, Disability and Health (ICF) and an important factor in children's and adolescent's health and well-being. Knowledge about their participation challenges and features in daily food-related activities is unfulfilled. In response to this paucity, and to encourage self-management, the Celiac Disease-Children's Activity Report (CD-Chart) was developed and its reliability and validity was established.

Methods

Following focus group interviews, nine food-related activities were chosen to comprise the CD-Chart and measured by six core dimensions: frequency, preference, preparation, involvement, help, and self-determination. The CD-Chart was administered to 126 children and adolescents aged 8-18 years with CD and a matched control group of 30 participants without CD.

Results

The CD-Chart items showed adequate reliability as measured by the preference dimension ($\alpha=.80$). Discriminant validity distinguished between the group with and without CD as measured by the preparation dimension. Quantitative age comparison revealed specific unique characteristics in the different dimensions. Additional qualitative input revealed essential self-management facilitators and barriers.

Conclusions

The CD-Chart is a reliable and valid tool that can contribute to portraying the participation in food-related activities and self-management characteristics of the gluten-free diet among children and adolescents with CD. These understandings can be integrated into determining multidisciplinary intervention goals to promote self-management, diet adherence, health and well-being.

Poster Shift 1: Childhood & Adolescence

PREDICTING SKELETAL MUSCLE MASS FROM DUAL-ENERGY X-RAY ABSORPTIOMETRY IN JAPANESE PREPUBERTAL CHILDREN

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Background and Aims

We aimed to develop regression-based prediction equations for estimating total and regional skeletal muscle mass (SMM) from measurements of lean soft tissue mass (LSTM) using dual-energy X-ray absorptiometry (DXA) and investigate the validity of these equations.

Methods

In total, 144 healthy Japanese prepubertal children aged 6–12 years were divided into 2 groups: the model development group (62 boys, 38 girls) and the validation group (26 boys, 18 girls). Contiguous MRI images with a 1-cm slice thickness were obtained from the first cervical vertebra to the ankle joints as reference data. The SMM was calculated from the summation of the digitized cross-sectional areas. Total and regional LSTM was measured using DXA.

Results

Strong significant correlations were observed between the site-matched SMM (total, arms, trunk and legs) measured by MRI and the LSTM obtained by DXA in the model development group for both boys and girls. When these SMM prediction equations were applied to the validation group, the measured total and regional SMM were very similar to the predicted values for both boys and girls. The results of the Bland–Altman analysis for the validation group did not indicate any bias for either boys or girls with the exception of the arm region for the girls.

Conclusions

These results suggest that the DXA-derived prediction equations are precise and accurate for the estimation of total and regional SMM in Japanese prepubertal boys and girls.

Poster Shift 1: Childhood & Adolescence

STATUS OF BONE MINERAL DENSITY AND NUTRIENT INTAKE AMONG FEMALE HIGH SCHOOL LONG-DISTANCE ATHLETE IN JAPAN

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Background and Aims

The Aim of this study is to determine the body composition and nutrient intake status of female high school long-distance runners and use those findings to develop a foundation for providing nutritional support within the framework of medical and scientific support.

Methods

Physical measurements, body composition (DEXA scan), blood tests, urinalysis and a survey of nutrition and diet were conducted on 12 female high school long-distance runners attending XX high school in Japan in 2016. Factors involved in health problems were examined based on the resulting data.

Results

(1) Energy intake was lower than the amount of energy required as calculated on the basis of physical activity level. (2) Bone mineral density was such that lumbar vertebra bone density was 0.88 ± 0.11 g/cm, which was low at $87 \pm 10\%$ [66%-100%] of the young adult mean (YAM). (3) There was a negative correlation between NTX values, which is an indicator of bone destruction, and whole body bone density. (4) All of the subjects were an ovulatory and estradiol levels were low in all subjects. There were no significant differences observed between estradiol levels and energy intake. (5) There was a negative correlation between NTX-based calculated creatinine values and energy intake.

Conclusions

The bone densities of female high school long-distance runners exhibited low values, and NTX levels (serum, urine) corresponded to values associated with postmenopausal women when compared with healthy individual reference values and normal reference values. Since proper energy intake is considered to be effective for improving bone density, it is important to provide continuous nutritional support.

Poster Shift 2: Childhood & Adolescence

SURVEY NUTRITION BEHAVIOR IN IRANIAN ADOLESCENCE GIRLS AND COMPARISON WITH INTERNATIONAL NUTRITION STANDARDS

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Background and Aims

Adolescence period during 13 to 19 years is a dramatic period. The studies show that prevalence of eating disorders in adolescence girls is higher than adolescence boys. The main reason is related to nutrition behavior. The aim study is to survey nutrition behavior in Iranian adolescence girls and comparison with international nutrition standards.

Methods

The study was a cross sectional study. The participants were 80 adolescence girls between 16 – 17 years who studied in a high school in west of capital city of Iran. The sample method was random sample.

The participants spent more than 12 hours in the high school and they ate lunch and 2 snacks there. Their teachers were affected on nutrition behaviors.

Results

The results show that just 50% teachers can teach enough and correct nutrition information to adolescence girls.

Unfortunately more than 80 percent of participants do not consider to time and kind of meals during day. 30% adolescence girls eat breakfast before starting day activities.

The study indicates that 70% participants do not have suitable mental focus which is associated with false nutrition attitude and nutrition behaviors. Moreover, the fruit and vegetable intakes in Iranian adolescence girls are below than 4 serving per day.

The comparison with international standards shows that just 10% participants have acceptable nutrition behavior in comparison with international standards.

Conclusions

It is concluded that teaching essential nutrition tips by nutritionists are very vital in high schools. Meanwhile, nutrition behavior consulting should be considered as a necessary need for adolescence girls who should be done by nutritionists.

Poster Shift 2: Childhood & Adolescence

STUNTING, WASTING AND UNDERWEIGHT IN DUTCH AND SOUTH ASIAN CHILDREN 0-5 YEAR IN THE NETHERLANDS: A COMPARISON OF ETHNIC SPECIFIC AND WHO REFERENCES

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Background and Aims

Doubts have been raised about the appropriateness of WHO Child Growth Standards for all ethnic groups. Stunting, wasting and underweight rates are generally higher in South Asian children than in other ethnic groups when socioeconomic conditions are similar or even better. Aim of this study was to compare the prevalence of stunting, wasting and underweight in Dutch and South Asian children in the Netherlands based on ethnic specific and WHO growth references.

Methods

Series of cross-sectional growth assessments (2012-2015) in 10,380 Dutch and 2,076 South Asian children aged 0-5 years living in the city of The Hague (the Netherlands), with 61,980 height and weight measurements. Stunting (height-for-age<-2SD), wasting (weight-for-height<-2SD) and underweight (weight-for-age<-2SD) rates were calculated based on WHO Child Growth Standards and ethnic specific references (Dutch, South Asian). Considering a normal distribution, a prevalence of 2.3% is expected.

Results

Stunting and underweight rates were high in Dutch (5.2% and 2.4%, respectively) and South Asian children (15.6% and 7.6%, respectively) younger than 6 months when WHO references were applied, whereas wasting rates in South Asian children were consistently high (up to 5.8%). Generally, higher rates were found in South Asian children compared to their Dutch counterparts based on WHO references. Application of ethnic specific references generally showed low prevalences for all studied indicators.

Conclusions

WHO Child Growth Standards seem to overestimate the prevalence of stunting, wasting and underweight, especially between birth and 6 months of age in Dutch infants, and in South Asian children in the Netherlands over the whole age range 0-5 years.

Poster Shift 2: Childhood & Adolescence

ASSOCIATIONS BETWEEN MILK AND YOGURT CONSUMPTION AND LIFESTYLE BEHAVIOURS IN EUROPEAN CHILDREN. THE IDEFICS STUDY

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Background and Aims

Lifestyle behaviours as diet, physical activity (PA), sedentary behaviours (SB) and sleep duration, are determinants of the health status. Moreover, the consumption of dairy products has been associated with a better health.

Analyse the associations between different lifestyle behaviours and milk and yogurt in a sample of European children.

Methods

A sample of 901 2-to-9-year-old children from the IDEFICS baseline survey and 2-years follow-up were included. Children's food consumption, SB and sleep duration were assessed with parental-reported questionnaires. PA levels were objectively measured. A healthy diet score (HDS) was developed from the food frequency questionnaire. Linear regression analysis was performed to analyse the relationship between each of the lifestyle behaviours and the consumption of milk and yogurt, adjusted by sex, age, mother's age and maternal education level.

Results

At baseline, in the overall sample and in the males group, a positive association was found between SB and milk consumption ($b=0.0030$; CI95%: 0.0008, 0.0052; $b=0.0034$; CI95%: 0.0003, 0.0066). Also a positive association was found between HDS and yogurt consumption in the females group ($b=0.0067$; CI95%: 0.0016, 0.0118).

At follow-up, increased PA levels were positively associated with changes in milk consumption in the overall sample and among females ($b=0.0078$ CI95%: 0.0017, 0.0140; $b=0.0109$; CI95%: 0.0022, 0.0195, respectively). Also, increased HDS were positively associated with changes in yogurt consumption, in the overall sample and females ($b=0.0053$ CI95%: 0.0011; 0.0094; $b=0.0081$; CI95%: 0.0016, 0.0145, respectively)

Conclusions

Lifestyle behaviours as PA levels and HDS are related with milk and yogurt consumption, especially among females.

Poster Shift 2: Childhood & Adolescence

AN EXAMINATION OF SCHOOL MEAL MENUS IN JAPAN

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Background and Aims

We analyzed school meal menus, an important aspect of education in Japan, and examined whether they could be used as teaching materials for dietary education.

Methods

We examined the contents of school meal menus published on the Internet using dietary guidelines* (i.e., staple, main dish and side dish as a basis for dietary balance) as an index. *Dietary guidelines (published by the Ministry of Education, Culture, Sports, Science and Technology, Ministry of Agriculture, Forestry and Fisheries, and Ministry of Health, Labour and Welfare)

Results

We found 63.6% of menus could be categorized into staple, main dish and side dish, with 46.5% of menus based on Japanese-style dishes and 25.6% on Western-style dishes. The staple was white rice in 57.8% of menus and bread in 26.4%. The main dish was meat in 44% and fish in 37%, while the side dish was seasoned vegetables in 27% and salad in 19% of menus. The staple, main dish and side dish could be categorized as Japanese style in a majority of menus, and the energy content was regarded as appropriate.

Conclusions

Menus that could be categorized into staple, main dish and side dish, were Japanese-style comprised of white rice (staple) and a fish or meat dish (main dish) and seasoned vegetables or soup (side dish), and appear to be effective as teaching materials for dietary education.

Poster Shift 2: Childhood & Adolescence

TRACKING OF COMPLEMENTARY FEEDING PRACTICES AMONG 9 TO 24 MONTH OLD CHILDREN IN NEPAL - THE MAL-ED BIRTH COHORT STUDY

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Background and Aims

Children in resource-poor settings are at high risk of malnutrition and poor growth due to inadequate complementary feeding practices.

The aims of this study were to evaluate infant and young child feeding (IYCF) indicators and tracking of dietary diversity scores (DDS), intake of iron- and vitamin A-rich foods and meal frequency in children from 9-24 months in Bhaktapur, Nepal, and to explore whether socio-demographic factors were associated with tracking patterns of these complementary feeding practices.

Methods

We measured the monthly food intake by 24h recall of 229 children (aged 9-24 months). Four time slots (each of four months) were used. Tracking was investigated using Generalized Estimating Equations (GEE) models and Cohen's weighted kappa (k_w). Multinomial logistic regression was used to identify determinants for tracking of DDS, intake of iron- and vitamin A-rich foods and meal frequency.

Results

The prevalence of minimum meal frequency (MMF) was higher than for minimum dietary diversity (MDD) at all time slots. Tracking based on absolute measures (GEE models) was moderate for DDS (0.48) and meal frequency (0.53), and low for intake of iron- (0.23) and vitamin A-rich (0.35) foods. Tracking based on rank measured was moderate for DDS and meal frequency, and fair for iron- and vitamin-A-rich foods. A low socioeconomic status significantly increased the odds of tracking low vs. high DDS (OR=3.31, CI 1.44, 7.60) and meal frequency (OR=3.46, CI 1.54, 7.76).

Conclusions

We found moderate tracking for DDS and meal frequency, which implies that interventions to improve these complementary feeding behaviors should be implemented early.

Poster Shift 2: Childhood & Adolescence

MATERNAL SOCIOECONOMIC CHARACTERISTICS AND GROWTH STATUS IN TODDLERS WITH HISTORY OF MEDICAL ILLNESS

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Background and Aims

Maternal socioeconomic inequalities influence growth status of children at community setting. The role of maternal socioeconomic characteristic in toddlers with history of medical illness at clinical setting is less well known. This study determines the growth status of toddlers with history of medical illness and its relationship with maternal socioeconomic characteristics.

Methods

This is a cross-sectional study recruited 73 toddlers with a history of medical illness (Aged : 22.1 + 0.63 months and most girls) from a selected pediatric clinic. Maternal socioeconomic characteristics assessed maternal education levels and employment status. We used WHO Child Growth Standard to assign height-for-age Z-scores (HAZ), weight-for-age Z-scores (WAZ) and weight-for-height Z-scores (WHZ).

Results

About 42% of the toddlers of whom both of their parents were employed and 69% of the toddlers had a mother with at least attained tertiary education levels. The toddlers with mothers who attained tertiary education levels tend to have higher HAZ-scores (- 0.89) than those mothers attended secondary education (-1.48) ($p = 0.06$). Toddlers with mothers who attained tertiary education levels had significantly higher WHZ-scores (-0.14) than those mothers attended secondary education level (-0.94) ($p = 0.002$). Toddlers whom of their mothers were unemployed have significantly higher WHZ (-0.77 + 1.03) than toddlers whom their mothers were working (-1.48 + 1.43; $p < 0.05$).

Conclusions

Maternal socioeconomic characteristics, which include employment status and education levels influenced growth status of toddlers with history of medical illness. Evaluation of maternal socioeconomic characteristics as part of the nutrition assessment is necessary for toddlers in clinical-based setting.

Poster Shift 2: Childhood & Adolescence

THE CAUSES OF MALNUTRITION IN CHILD GROWTH AND DEVELOPMENT

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Background and Aims

More than one third of all child deaths every year around the world are attributed to malnutrition which specifically weakens the body's resistance to illness. Malnutrition develops when the body does not get the proper amount of energy (calories), proteins, carbohydrates, fats, vitamins, minerals and other nutrients required to keep the organs and tissues healthy and functioning well. To prevent malnutrition, the child must be provided with a balanced diet in order to prevent being under nourished or over nourished among the children.

Methods

If a woman is malnourished during pregnancy or if her child is malnourished during the first two years of life, the child's physical and mental growth and development will be slowed and it will affect the child for the rest of his or her life. So the parents should seek for medication or advise as soon as possible.

Results

In most parts of the world malnutrition occurs when people are undernourished. Primary reasons for undernourishment, especially of children and women are poverty, lack of food, repeated illnesses, inappropriate feeding practices, lack of care and poor hygiene. Undernourishment raises the risk of malnutrition. The risk is greatest in the first two years of life. The risk further increases when diarrhea and other illnesses were the body of the proteins, minerals and nutrients required to stay healthy.

Conclusions

In conclusion, there should be provision of a balanced diet and enough food to children because when they become sick, they lose energy and nutrients quickly, which puts their lives at risk to malnutrition

Poster Shift 2: Childhood & Adolescence

CHANGES IN SUSCEPTIBILITY TO SEVERE AND FATAL PNEUMONIA FOLLOWING TREATMENT FOR SEVERE ACUTE MALNUTRITION AMONG KENYAN CHILDREN

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Background and Aims

Severe acute malnutrition (SAM) is associated with a markedly increased susceptibility to pneumonia. Besides anthropometric recovery, treating SAM is expected to reduce the risk of pneumonia, but this reduction has not been characterized. We examined changes in the monthly incidence of pneumonia episodes and determined the effects of anthropometric recovery on susceptibility, severity and case fatality ratios (CFR) of pneumonia during one year after SAM treatment.

Methods

We analyzed data of 1,778 HIV-uninfected children aged 2-59 months with SAM enrolled in randomized controlled trial investigating the efficacy of daily co-trimoxazole prophylaxis in reducing long-term mortality. They were followed up for 12 months (1556.6 child-years of observation (cyo)). Main outcome was subsequent pneumonia episode and exposures were follow-up anthropometric measures.

Results

There were 1354 and 354 episodes of any pneumonia and severe pneumonia, amongst 719/1778 (40%) children; yielding incidence rates of 0.89 (95% CI 0.85-0.94) and 0.23 (95% CI 0.21-0.26) episodes per cyo respectively. The CFR for any pneumonia and severe pneumonia were 8.3% and 26% respectively. Nutritional recovery to achieve Mid Upper Arm Circumference (MUAC)-for-Age z-score \geq -2 was associated with 54%, 79% and 86% reductions in risk of any pneumonia, severe pneumonia and fatal pneumonia respectively. A monthly increase of MUAC by \geq 0.5 cm was associated with reduction in risk of any pneumonia, severe pneumonia and pneumonia CFR by 36%, 60% and 83% respectively.

Conclusions

Nutritional recovery was associated with reduction in risk of pneumonia. Policy to support nutritional recovery and avoid relapse are needed to reduce pneumonia susceptibility.

Poster Shift 2: Childhood & Adolescence

FOOD CHOICES AND PHYSICAL ACTIVITY IN DIABETIC CHILDREN

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Background and Aims

Type 1 Diabetes Mellitus (T1DM) is one of the most common chronic illness in children, which could affect a normal development of diabetic children. Apart from insulin replacement, a balanced diet and physical activity are a key part of managing diabetes. We aimed to investigate a food choices and physical activity in children with T1DM.

Methods

The study was conducted among 42 children, aged 8-18 years with T1DM who attended to check-up visit in Diabetes Centre in Poznan. Frequency of food intake and physical activity were assessed with a self-administrated Eating Behaviour Questionnaire and Physical Activity Questionnaire for Children which was filled out by children or/and children's parents.

Results

The mean age was 14.9 years. All children had at least 3 meals per day and breakfast (93%). Typically breakfast consisted sandwich with ham or cheese. 21.5 % children added sugar beverages. 88% children took food and drinks to school and 93% ate snacks (78% fruits vs. 55% sweets). 33.3% of respondents took diet supplements. Majority consumed fruits and vegetables 3-4 times per week, 86% had fish at least once week, 92% ate meat once or more per week. 30% of kids ate fast food 1-3 times per month. 45% children had physical education class once a week and 55% had twice a week.

Conclusions

Most children had healthy eating attitudes. Nerveless, some of them added sugar to beverages and chose sweets for snacks. Majority of children had only physical activity at school. Nevertheless, diabetic children need more education about nutrition and physical activity.

Poster Shift 2: Childhood & Adolescence

BODY IMAGE PERCEPTIONS AND DIETARY PRACTICES OF FEMALE ADOLESCENTS IN SENIOR HIGH SCHOOLS IN TAMALE METROPOLIS

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Background and Aims

Body dissatisfaction is a risk factor for eating disorder among female adolescents. The main objective of study was to assess body image perceptions and dietary practices of adolescents in senior high schools.

Methods

A cross sectional survey was carried out in Tamale metropolis. A total of 200 teenage girls (13-19 years) were recruited for the study. A non-convenience method of sampling was used to select study participants. Demographic data, body image perception and dietary practices of study participants were gathered using a validated self-administered questionnaire. A picture showing ranges from thin to the fattest (A-H) were shown to them in the questionnaire.

Results

Almost half (n=98, 49%) of the participants chose E as the one they perceived to look best. Forty seven percent chose H to be clumsy while 33% chose D to have more respect from friends and 34.5% perceived E to be the strongest. Also, less half (n=86, 43%) of the participants perceived H to be the most unhappy and 53% wished to look like E while 66% said their parents would like to be like E.

Majority (n=165, 82.5%) of the participants said they had normal weight with half (52%) of them being happy about their present body weight. Most (72%) of them were not worried about being thin compared to 50.5% who said they were not worried about being fat. Again, 67% indicated that they tried to lose weight whereas 52% had not tried to gain weight.

Conclusions

Having positive or negative body image may influence adolescent eating habits.

Poster Shift 2: Childhood & Adolescence

INTESTINAL MICROBIOTA DISTURBANCES IN CHILDREN WITH FUNCTIONAL GASTROINTESTINAL DISORDERS AND ITS CORRECTION

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Background and Aims

In the development of functional gastrointestinal disorders (FGIDs) intestinal ecological community play a significant role.

Evaluation the role of intestinal biocenosis disturbances (IBD) in the development of FGIDs in infants and efficacy of LGG in its correction.

Methods

We examined 69 children with IBD on the background of FGIDs. The study group (n=35) received two-week course of age dose LGG, the control group (n=34) did not receive any probiotics.

Results

Various quantitative and qualitative IBD were found in all examined children. After treatment in the study group 26.47% (95% CI 11.64-41.29) remained signs of regurgitation, 23.52% patients (95% CI 9.26-37.77) – colic. In the control group colic and regurgitation were observed in 51.43% (95% CI 34.87-67.98), functional constipation – in 22.85% (95% CI 8.93-36.76). The significant difference was found among these symptoms: colic ($\chi^2 = 4.59$, $p = 0.03$, OR = 3.44 (95% CI 1.09-11.08)), regurgitation ($\chi^2 = 0.87$, $p = 0.34$, OR = 1.85 (95% CI 0.59-5.82)), functional constipation ($\chi^2 = 0.80$, $p = 0.37$, OR = 1.85 (95% CI 0.59-5.82)). According to 2 years monitoring of the examined children FGIDs (constipation) were present in the study group – 11.76% (95% CI 0.93-22.59), in the control group – 16% (95% CI 4.66-29.63); OR was 0.64 (95% CI 0.17-2.52 ($\chi^2 = 0.40$, $p = 0.53$)).

Conclusions

The results showed a high efficacy of LGG application in FGIDs complex treatment, while long-term observation showed no significant difference in both groups and the necessity of repeated correction of IBD.

Poster Shift 2: Childhood & Adolescence

COMPARISON OF NUTRITIONAL STATUS OF YOUNG PATIENTS WITH CEREBRAL PALSY OBTAINED FROM SIMPLE ANTHROPOMETRIC MEASUREMENTS, SKINFOLD THICKNESSES AND BIOIMPEDANCE

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Background and Aims

Patients with severe cerebral palsy (CP) are often malnourished. Our aim was to compare the results of several different methods that are regularly used in clinical praxis for determination of nutritional status and to find out how the selection of method influence the proportion of patients that are defined as malnourished.

Methods

In group of 53 young (2-26 years old) patients (30 boys, 23 girls) with severe CP (grade V GMFCS), body weight, ulna length (to calculate height), skinfold thicknesses (ST) and bioimpedance measurements (BIA and STA, Akern) (BI) were obtained. Weight-for-age, body mass index (BMI) and proportion of body fat calculated from BMI, ST and BI were compared with references.

Results

Weight-for-age below 3rd percentile was found in 83 % of patients when reference values for healthy population were used, but in only 32 % it was below 10th percentile according to the special references for CP patients. BMI-for-age Z-score below -2 for healthy was found in 68 % of patients. Proportion of fat below 5th percentile was found in 50 %, 38 %, 53 % of patients when calculated from BMI, ST and BI, respectively.

Conclusions

We confirmed that huge proportion of patients with severe CP is malnourished, however the estimation of nutritional status is heavily dependent on the method that is used.

Poster Shift 2: Childhood & Adolescence

EVALUATING THE EFFECTIVENESS OF TREATMENT APPROACHES FOR CHILDREN WITH FEEDING CHALLENGES: INTERPROFESSIONAL PARENT GROUP INTERVENTION AND INDIVIDUAL OCCUPATIONAL THERAPY TREATMENT

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Background and Aims

Clinician workload in Occupational therapy feeding caseload has increased for numerous reasons including the new diagnostic category, Avoidant/Restrictive Food Intake Disorder. To intercept this change group interprofessional strategies are used to treat patients. Evidence supports this approach as an optimal means to increase patient satisfaction. This bodes well as it has been shown that parental satisfaction with a treatment modality translates into better adherence to a treatment plan. However, parents' perceptions of this new approach are not well documented.

The purpose of this study was to acquire early insight into parents' perceptions of an interprofessional group (IG) service delivery model and an individual one-on-one (ONO) approach.

Methods

Participant eligibility was determined through referrals to Occupational Therapy for feeding challenges. Forty participants, 20 per group, were recruited using convenience sampling. Assignment was through simple randomization. The Measuring Process of Care (MPOC)-20, a 7-point Likert scale designed to assess parents' perceptions of healthcare professionals' behaviour, was used. The study received REB approval.

Results

The IG scored high across all five constructs (mean range 4.9-5.9). Two of particular importance, Coordinated & Comprehensive Care and Respectful & Supportive Care have means of 5.76 and 5.9 respectively. The scores across all constructs and between groups can be ranked identically.

Conclusions

Results offer further evidence that an Interprofessional-lead group program can provide care that parents are satisfied with. Moreover, the authors are in agreement that the value provided by the IG is in-line with patient and healthcare expectations.

Acknowledgements: CHEO Feeding Team

Poster Shift 2: Childhood & Adolescence

SENSORY EXPERIMENTS IN KINDERGARTEN - DEVELOPMENT AND EVALUATION OF A TRAINING PROGRAMME

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Background and Aims

Familiarity being the most important determinant of a child's liking for a particular food, consumption patterns strongly influence children's food preferences. In order to facilitate a broader experience with food leading to a healthier diet in an early age, pedagogical staff was trained to provide suitable sensory and nutritional education for the children.

Methods

28 kindergarten teachers participated in a training providing crucial information on sensory development, adequate nutrition and conduction of sensory experiments. Consequently, these teachers tested 12 experiments with their groups of kindergarten children. Specially developed note cards gave instructions for implementation of the sensory experiments. For evaluation, teachers completed online questionnaires on practicality for each experiment and shared their experiences in a closing focus group.

Results

The feedback (questionnaire/focus group) for all experiments and the training was positive. Kindergarten teachers found the preparation in the training adequate and were thus enabled to conduct the experiments without problems. Positive feedback from parents (e.g. on increased openness towards new foods or increased food vocabulary) as well as behavioral changes at kindergarten lunches were reported. Changes to the note card design were requested and implemented.

Conclusions

All tested experiments are suitable for use in kindergarten and had the intended effects. However, long term effects have yet to be evaluated. Especially experienced kindergarten teachers were able to adapt the experiments to younger nursery school children or differing group sizes. An extension of the experiments and the training portfolio for primary school children is intended.

Poster Shift 2: Childhood & Adolescence

THE IMPACT OF MOTHER'S PRENATAL BODY MASS INDEX AND BREASTFEEDING ON OVERWEIGHT IN KAUNAS PRESCHOOLERS

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Background and Aims

The combination of mother's prenatal overweight and a short duration of breastfeeding may be associated with an elevated risk of children's overweight, but data are sparse. The objective of this study was to examine the association between maternal overweight, breastfeeding duration and overweight in preschoolers.

Methods

This follow-up study included 621 mother-child pairs who are part of pregnant women's cohort study from 2007–2009. Information on individual study participants' data obtained from the filled standardized questionnaires of the parents. We used the International Obesity guidelines for estimation of adults and children's overweight and obesity. The impact of mother's overweight and duration of breastfeeding in months on children's weight were examined by using logistic regression analyses.

Results

Some 7.2 % of the children were overweight or obese. Maternal overweight was associated with a 64 % higher risk of overweight or obesity among preschoolers. Children who had been breastfed for >6 months had a lower risk of becoming overweight compared with children who were breastfed for shorter period independently on mother's body mass index. Mother's overweight and short breastfeeding were associated with increased adjusted odds ratios for children overweight (aOR 1.81; 95 % CI 0.79, 4.16).

Conclusions

The maternal prenatal overweight and a short duration of breastfeeding are the risk factors for children's overweight. These factors should be controlled by intervention programs targeted to prevent childhood obesity.

Poster Shift 2: Childhood & Adolescence

NUTRITIONAL STATUS AND ANEMIA IN CHILDREN 6 TO 59 MONTHS OF AGE FROM WESTERN AND EAST REGION OF CUBA.

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Background and Aims

Growth and development of children are indicators of nutritional status related to food intake. Anemia, mainly to iron deficiency, is associated to micronutrient shortage. Food and Nutrition intervention programs are implemented to prevent and control the malnutrition and anemia in pre-school children.

Objective: Evaluate the nutritional status and anemia of children 6 to 59 months of age in two vulnerable regions of Cuba.

Methods

400 children of Western Region(Mayabeque-Isla de la Juventud) in 2015 and 435 children of Eastern Region(SCuba-Holguin) in 2016 were evaluated. Weight, Height and Weight for Height were evaluated by Cuban Growth Charts; Hemoglobin was measure by hematological cell counter ABX Micros 60.

Results

Undernutrition were no nutritional health problem(<10%), but highest in Eastern Region(6.2%) vs Western Region(2.2%). Stunted were also no nutritional problem(<3%), higher in Eastern Region(2.2%) vs Western Region(0.5%). Global overweight was highest in Western Region(15%) vs to Eastern Region(9.7%). Anemia was 14.1% in Western Region(mild health problem) vs 22.7% in Eastern Region(moderate health problem). The group up to 2 years old was more anemic; children of the Eastern Region had almost the double percentage of anemic(42.1%) vs Western Region(28.5%). Weight over Percentile 90 of Cuban chart(excessive weight) was a protector factor for anemia(OR-MH=0.56 CI95%=0.32-0.98), but anemia and global overweight by Weight for Height (overweight plus obesity) was no significant associated(OR-MH=0.52 CI95%=0.26-1.06).

Conclusions

Undernutrition and Stunted are not a health problem in children. Anemia is a nutritional health problem. Eastern Region had been continuous the most vulnerable population. Excessive weight was a protective factor for anemia in children studied.

Poster Shift 2: Childhood & Adolescence

THE ASSOCIATION OF EL NINO SOUTHERN OSCILLATION WITH INTRA- AND INTER-GENERATIONAL CHANGES IN THE HEIGHT AND WEIGHT OF PEOPLE BORN IN INDIA

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Background and Aims

One of the most extreme climate phenomena worldwide, El Niño Southern Oscillation (ENSO), alters international weather patterns causing natural disasters, such as floods or prolonged droughts. This, in turn, has numerous consequences for public health. India is one of the countries that face extreme fluctuations in the country's weather patterns due to ENSO. Therefore, we used India as an example to investigate the effect of this phenomenon on health.

Methods

A large sample size dataset from that country, obtained from DHS, was exploited. The height and weight of women born during ENSO-related periods were compared with those of women born during non-ENSO-related periods, while inter-generational effects were also assessed by investigating the anthropometric data of the offspring of those women.

Results

The outcomes demonstrated that early-life exposure to El Niño is linked to women growing up significantly shorter and lighter, while exposure to La Niña is linked to them growing up significantly heavier; these links were stronger for women being 6-12 months of age when the ENSO event took place. The results were less clear for inter-generational effects of ENSO but there were strong indications that they can exist, with male offspring appearing more sensitive to the La Niña event.

Conclusions

As the current consensus is that ENSO will continue to occur in the future, public health outcomes will continue to be associated with this phenomenon. Therefore, further studies exploring ENSO's long-term effects on human health can be assumed vitally important, in order to drive the design of protective approaches for those effects.

Poster Shift 2: Childhood & Adolescence

BODY SIZE AND TYPE OF CHILDREN AGED 7 – 18 YEARS IN YOGYAKARTA PROVINCE, INDONESIA

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Background and Aims

The general pattern of postnatal growth is quite similar from one individual to another, but there is considerable individual variability in size and rate of growth at different ages, with respect to body as whole and specific parts. The aim of this study was to establish growth pattern of urban children in Yogyakarta and compare with rural children in Bantul.

Methods

Anthropometric measurements and somatotypes of children are considered in a cross-sectional sample of Yogyakarta Province, consisting of 1447 children (677 boys and 770 girls), 7 through 18 years of age. Heath-Carter somatotypes and body mass index (BMI) were determined in urban and rural children.

Results

The results indicated that the boys were taller and heavier than girls. In urban children, there were significant differences of stature, weight, biacromial breadth, and somatotype components between boys and girls (3.6 – 2.1 – 3.3 and 3.5 – 2.5 – 3.4). Boys and girls in rural area were different significantly in stature and somatotype components. Significant differences were also observed in somatotypes between urban and rural boys. Whereas, biacromial and bicristal breadth, BMI, second and third somatotype components were different significantly between urban and rural girls.

Conclusions

The findings indicated that urban children were taller, heavier, wider biacromial and bicristal breadth, greater BMI, more endomorphic and less ectomorphic than rural children. However, both populations have similarities in somatotypes distribution.

Poster Shift 2: Childhood & Adolescence

TRANSIENT POSITIVE CELIAC SEROLOGY and INTESTINAL INFECTIONS

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Background and Aims

Lymphocytic gastroduodenitis due to a myriad of gastrointestinal infections, can sometimes been associated with a transient shift of celiac serology
We present two cases with peculiar associations ...

Methods

1st case: The 3 year old girl is sent for celiac serology returning family screening (weakly) positive. Duodenal biopsy found a duodenitis. Helicobacter pylori without celiac disease stigma. She is put on triple therapy and monitored clinically and immunologically every 3 months. After 1 year of follow up, her serology were negative (with anti-deamidated gliadin IgG and IgA made at 12 months, also negative) and remains free of clinical signs.

Case 2: A boy of 13 years followed for 4 years in private for failure to thrive that would be due to celiac disease (serology but still <20 IU / ml), and having received three fibroscopies with duodenal-jejunal biopsy demonstrating a partial villous atrophy without cryptic enlargement. Another histology confirms the Giardia, 3 courses of metronidazole are prescribed. The subsequent negativity celiac serology and the absence of risk HLA allow free diet.

Results

Celiac disease (CD) can, by itself, induce lymphocytosis along the digestive tract; but duodenal lymphocytosis are more than 80% of cases due to other etiologies than gluten intolerance.

Also, during the silent forms of MC (including serological turn without clinical signs), many "triggers infectious agents" are implicated.

Most authors do not advocate gluten-free diet at first, but any confounding risk, ie. genetic, imposes regular monitoring.

Conclusions

The spectrum of enteric infections simulating or associating celiac disease includes a large panel; Helicobacter pylori and Giardia lamblia being the most common...

Poster Shift 2: Childhood & Adolescence

SHORT STATURE and CELIAC DISEASE : RESULTS OF A REGIONAL SCHOOL SCREENING

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Background and Aims

Celiac disease is a well-known cause of short stature in children, sometimes revealed by isolated height deficiency

We report the results of a school screening for short stature.

Methods

Primary school children in 08 schools Setif (nearly 2500 pupils, purposive random choice) underwent anthropometric measurements, including measurements of height with reports on WHO growth charts according to age and sex.

Results

Of the 2493 cases collected, 47 had a height Z Score $< -2DS$ from age, including 3 celiac patients: 02 children already diagnosed as gluten intolerant and a boy, asymptomatic, detected by this screening then diagnosed according to the ESPGHAN 2012 criteria and put under exclusion diet.

Conclusions

The high prevalence of celiac disease in North Africa should encourage its broad screening. Similarly, regular anthropometric monitoring helps identify errors in diet, associated diseases (including diabetes or hypothyroidism) or the rarest refractory sprue.

Poster Shift 2: Childhood & Adolescence

URBAN VERSUS RURAL ORIGIN REDUCES THE RISK OF SHORT STATURE: RESULTS OF A REGIONAL SURVEY

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Background and Aims

The stature of the child is the mirror of an interplay from several causes, mostly nutrition. To estimate the prevalence of short stature, a cohort survey was conducted in Setif Region, Algeria.

Methods

The survey was a descriptive cross-sectional study with a representative sample of pupils in preschools and primary schools of the town of Setif.

Method of sampling was a random sampling cluster at 2 degrees:

cluster = school; while levels were separated as level 1 = level of education, level 2 = classroom number.

The choice of classes was done randomly.

Inclusion criteria were:

- For anthropometry measures = children aged 5 to 11 years
- For estimating genetic target size and the questionnaire = height Z Score < -2 according to WHO reference curves.

Results

The study involved 2,493 elementary school children across eight schools in the town of Setif, including five located in urban areas (Setif Center) and three semi-rural suburban areas. The prevalence of short stature in the study population is 47 enfants / 2493 = 1.9% (confidence interval = 95 [1.4 to 2.4])

According to geographical origin, the prevalence in suburban areas is double that in urban areas; they were 3% and 1.2% respectively; the chi-square test is highly significant ($p = 0.001$).

The geographical origin helps underpin a socioeconomic hypothesis and criminalize an undernutrition related-cause to deficient height.

Conclusions

The stature deficiency is often due to a nutritional deficiency: rural origin strongly associated with short stature emphasizes the importance of socio-economic conditions and should lead to a more stringent monitoring of this fragile segment of the population.

Poster Shift 2: Childhood & Adolescence

MALNUTRITION IN A LARGE SCHOOL-AGED COHORT

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Background and Aims

An auxological study of elementary school aged children was conducted in Setif, Algeria ; and the measures were converted to different parameters among which Body Mass Index in order to estimate the local prevalence of malnutrition

Methods:

The study involved pupils aged 5 to 12 years, across eight schools in both urban and suburban areas of Setif (easteren Algeria)

Anthropometric measures were done according to recommended standards, height and wieght being converted to calculated Body Mass Index (BMI) and reported to World Health Organization BMI References (WHO 2007)

Results:

2493 pupils were screened and subsequently classified according to their Body Mass Index into :

- Thinness
- Normal
- Overweight
- Obesity

Overweight and obesity were estimated at a prevalence = 15,5% ; while thinness was estimated to a prevalence of 4,5%.

Table 1 summarizes children' repartition

BMI Class	Frequency	Percent
] -4DS, -3DS] Severe thinness	22	0,9
[-3DS, -2DS[Thinness	90	3,6
[-2DS, 0DS[Normal	1 326	53,2
[0DS, +1DS[Normal	668	26,8
[+1DS, +2DS[Overweight	272	10,9
[+2DS, +3DS[Obesity	115	4,6
Total	2 493	100,0

Conclusions

This distribution of BMI in school aged children is shifted at the right of the Gaussian distrubution, and thus confirms the global trend toward overweight and obesity in developping countries

Poster Shift 2: Childhood & Adolescence

MILK CONSUMPTION AND BMI: A STUDY ON PRIMARY SCHOOL AGED CHILDREN IN SOUTHERN IRAN

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Background and Aims

The prevalence of overweight and obesity among children has been increasing globally. Childhood obesity is highly associated to adult obesity. Our aims are determine of association between milk consumption and BMI.

Methods

A self-reported questionnaire for estimating the amount of milk consumption by subjects during past year was used. The daily intake of milk was computed based on milliliters. Weight was measured with digital scales (Seca 881, Germany) to the nearest 0.1 kg while the students were wearing minimal clothing without shoes. Height was also measured without shoes and was recorded to the nearest 0.1 cm using a stadiometer (Seca 2.14 portable stadiometer). BMI was calculated with SPSS software, version 16 and was compared with CDC diagrams of World Health Organization.

Results

There was a significant negative correlation between milk consumption and BMI. ($r = -0.075$, $p = 0.02$)

Conclusions

In our study the children who consumed more milk had lower BMI. This negative relationship could be linked to high amount of calcium in milk. Our study stressed out the importance of milk consumption in prevention of childhood and adolescent obesity that could lead to adulthood obesity.

Poster Shift 2: Childhood & Adolescence

A STUDY ON SLEEP, DIETARY HABITS AND LIFESTYLE OF ITALIAN PRIMARY SCHOOL CHILDREN

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Background and Aims

The prevalence of overweight and obesity in children has risen greatly worldwide. Diet and physical activity are the two risk factor usually examined, however there is some epidemiological evidence suggesting a link between sleep duration and overweight/obesity in children. The aim of this project was to describe the relationship among body mass index (BMI), sleep, diet quality, and physical activity level (PAL).

Methods

The study was conducted on children in the 5th grade of primary schools (10/11 ys old) in the city of Parma (Italy) by: i) measuring their BMI; ii) administering a diet questionnaire explaining adherence to the Mediterranean Diet (KIDMED score); and iii) administering a lifestyle questionnaire allowing to classify children sleep habits and PAL.

Results

Data on 748 children were analysed. A highly significant negative association was found between BMI and sleep hours (p -value <0.0001). Moreover, there was a significant association between PAL and KIDMED scores (p -value = 0.003). No evidence was found between BMI and PAL, and between BMI and KIDMED.

Conclusions

Data from this study established that BMI is correlated both to diet quality and sleep duration, setting sleep habits as one of factors linked to overweight and obesity besides diet and PAL.

The study was performed within GIOCAMPUS project and has been approved by the Ethical Committee of the University of Parma (n5348-15/02/16). The authors declare no conflict of interests.

Poster Shift 2: Childhood & Adolescence

THE USEFULNESS OF ANTHROPOLOGICAL METHODS IN THE ASSESSMENT OF THE PHYSICAL DEVELOPMENT IN PATIENTS WITH INBORN ERRORS OF METABOLISM

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Background and Aims

Almost all inborn errors of metabolism are included to the group of rare diseases. Definition of rare diseases is based on the criterion the frequency of occurrence 1 in 2,000 people. In many of these syndromes body stature and craniofacial abnormality, and dynamically change in developmental process is disturbed, therefore assessment of body proportion, dysmorphic characteristics and morphological parameters must be determined and monitored precisely. This can be achieved only with the help of an anthropologist having adequate tools. That is why the role of anthropologist is not to be overestimated in collaboration with the physician in the diagnostic process.

The aim of this study was: clinical anthropologist's contribution in an assessment of physical development and a better understanding of nature history of the rare metabolic diseases.

Methods

Anthropometric techniques and methods such as analysis of demographics, birth date, percentile charts, growth patterns, bioimpedance analysis, somatometric profile, craniofacial profile, body proportion's indexes and mathematical models of growth curves was presented on the on some of rare diseases examples.

Results

Process of development in patients with rare diseases is disturbed, therefore assessment of body proportion, dysmorphic characteristics and morphological parameters must be determined and monitored precisely. This can be achieved only with the help of an anthropologist having adequate tools. That is why the role of anthropologist is not to be overestimated in collaboration with the physician in the diagnostic process.

Conclusions

Anthropology have an important impact in diagnostic process of rare genetic disease.

Poster Shift 2: Childhood & Adolescence

NUTRITION, PHYSICAL AND SOCIAL ACTIVITY STATUS IN SECONDARY SCHOOL CHILDREN

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Background and Aims

Adolescence period is the most increasing period of autonomy for exercising and nutritional habits, it is important to develop healthy eating and physical exercise in this period. This research carried out to investigate the awareness of secondary school students about physical activity and healthy eating and also to determine the factors that affect eating and physical activity behaviors.

Methods

513 volunteers from two secondary schools of Maltepe were recruited in this cross sectional research by simple random sampling. Social, physical activities and eating behavior of children were compared to the age, gender, height, weight, physical activity status of the children, income level and educational status of the family, occupation of the children's mother.

Results

Of the participants%49.2 think that drinking 1,5-2 liters of liquid in a day is necessary. Participants who attempt to lose weight do more exercise than the others who do not weight($p=0,005$). There is no significant difference between the children in state school and in private school ($p=0,628$). Boys are found to engage more physical activity than girls ($p<0,001$). There is an association between the educational level of the mother and attempting to loose weight of the child ($p=0,009$).

Conclusions

According to the research results there are associations between the eating -physical activity habits and the educational status of the family, gender of the children.

Poster Shift 2: Childhood & Adolescence

GROWTH CHARACTERISTICS OF OFFSPRING BORN TO WOMEN WITH GESTATIONAL DIABETES: NARRATIVE REVIEW OF LITERATURE

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Background and Aims

Gestational diabetes mellitus (GDM) affects approximately 14% of pregnancies. GDM-offspring (GDM-F1) are at increased risk of obesity in later life. This review aims to evaluate growth characteristics of GDM-F1 during early childhood and pre-and post-natal influencing factors of childhood obesity.

Methods

Medline was searched for articles published from 1995 to Feb 2016 with search terms related to growth in GDM offspring. Titles/abstracts and full text were screened based on a priori inclusion/exclusion criterion for eligibility including a minimum of one growth parameter was measured at two time points.

Results

The search identified 877 articles of which 18 studies were included for evaluation (n=8 for GDM-F1 only and n=10 for GDM-F1 vs normal glucose tolerance-offspring (NGT-F1)). Increased weight gain was reported in 1 study, decreased in 1 study while 2 studies reported no differences in weight gain in GDM-F1 VS NGT-F1. While 3 out of 4 studies indicated higher skin fold thickness around 1 and 6 weeks, 1 and 5yrs, only 2 out of 4 studies reported higher BMI at 6 months and 5yrs, among GDM-F1vs NGT-F1. Pre-natal and post-natal factors e.g., high pre-pregnancy BMI, 2hr post-prandial blood glucose, GDM with or without diabetes after birth and large for gestational age are reported to contribute to the increased risk of early childhood overweight/obesity.

Conclusions

Based on limited published information, GDM-F1 showed age-specific differences in BMI, weight gain, SFT during early childhood. Timely diagnosis of growth deviations and recognition of the pre-natal and post-natal factors is crucial to reduce the risk of obesity in GDM offspring.

Poster Shift 2: Childhood & Adolescence

RELATIVE VALIDATION OF A SEMI-QUANTITATIVE FOOD FREQUENCY QUESTIONNAIRE FOR ADOLESCENTS

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Background and Aims

A food frequency questionnaire (FFQ) able to measure food intake is a priority for epidemiological studies considering the potential associations between dietary factors and disease-related markers. The aim of this study was to validate a semi-quantitative FFQ for Portuguese adolescents.

Methods

A cross-sectional analysis was conducted. A semi-quantitative Portuguese food frequency questionnaire (SQ-PortFood-FQ) was developed and validated using a three-day multiple-pass 24-hour recall as the reference method. Eighty-three adolescents (aged 10 to 16 years) completed the SQ-PortFood-FQ and answered the multiple-pass 24-hour recall in order to measure energy intake (EI), raw macronutrients intake (MI) and energy-adjusted MI obtained from both SQ-PortFood-FQ and multiple-pass 24-hour recall. Since there is no consensus in the literature on the best statistical method for assessing the validity of a FFQ, the validation was performed by a set of statistical methods.

Results

EI showed reliability by Spearman's correlation coefficients ($r = 0.52$; $P < 0.01$) and by the ICC ($= 0.47$; $P < 0.001$). A good level of agreement was obtained for EI with a level of concordance of 0.41, almost 40% of the participants classifying in the same quintile and 1.2% grossly misclassified. At individual level and according to the Bland-Altman method the SQ-PortFood-FQ was considered acceptable accurate for EI.

Conclusions

The results demonstrated that the SQ-PortFood-FQ is reliable and accurate for EI. As far as we know this is the first FFQ validated for Portuguese adolescents.

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Poster Shift 2: Childhood & Adolescence

A 17-YEAR-OLD GIRL WITH EOSINOPHILIC ESOPHAGITIS

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Background and Aims

Eosinophilic esophagitis (EoE) is a chronic, immune/antigen-mediated esophageal disease. Findings of esophageal rings, linear furrows of mucosa, white exudates and narrowing of the caliber of the esophagus are suspected for EoE but not pathognomonic. The most common symptoms are vomiting, dysphagia, abdominal pain and food impaction. The diagnosis of EoE is based on histopathological findings (HF) of esophageal eosinophilia (Table 1). If the esophageal eosinophilia persists after 8 weeks of proton pump inhibitors (PPIs) therapy the diagnosis of EoE can be made. EoE is a gastrointestinal manifestation of food allergy but allergy testings are positive in only 15-43% of patients. Elimination diet (ED) is a primary therapeutic option (Table 2).

Methods

A 17-year-old girl presented with epigastric pain and haematemesis. We performed esophagogastroduodenoscopy (EGD) and HF was indicative for EoE. The allergy testing was positive on dairy, peanuts, soybeans, rice, rye and wheat. 8 weeks of PPIs therapy was conducted. After the second EGD the EoE diagnosis was confirmed. The nutritionist gathered data about the girls' eating habits.

Results

An education about ED was performed and adequate diet was recommended in order to meet nutritional and energy needs for a girl of her age. Through further follow-up no weight loss and no nutritional deficit was registered.

Conclusions

With this case report we wanted to show the importance of a multidisciplinary approach in pediatric patients with EoE in order to prevent the development of nutritional deficit and to ensure healthy adult life of this vulnerable population.

Poster Shift 2: Childhood & Adolescence

WEIGHT, HEIGHT AND BMI REFERENCES FOR 6 TO 18 YEAR-OLD IN AUTONOMOUS REGION OF MADEIRA, PORTUGAL

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Background and Aims

Nutritional and growth monitoring require up-to-date reference growth data built from representative samples of the population. The aim of this study was to develop anthropometric references for weight, height and body mass index (BMI) for age and sex of 6 to 18 year-old people of the Autonomous Region of Madeira.

Methods

Cross-sectional study, carried out in two phases. The first between May 2004 and May 2005 (in 1st cycle schools) and the second between October 2007 and June 2009 (in 2nd and 3rd cycle schools, and in secondary and professional schools). It includes a representative sample of 6987 people, with 3532 girls and 3455 boys from 6 to 18 year-old. Weight and height were measured according to international standards and calculated the BMI. To elaborate the smoothed percentiles and z-scores curves for age and sex, the values were estimated between 72 and 225 months (every three months) using the LMS statistical procedure, with the exponent of the Box-Cox (L), the median (M) and coefficient of variation generalized (S) through LMSChartMaker software, version 2.76.

Results

Mean and standard deviation values as well as charts of smoothed percentiles curves (P3, P5, P10, P25, P50, P75, P85, P90, P95 and P97) and z-scores (-2, -1, 0, 1 and 2) are presented by age and sex.

Conclusions

This is the 1st study in Portugal in which anthropometric measurements of a representative sample 6-18 year-old people were collected, leading to the establishment of local references.

Poster Shift 2: Childhood & Adolescence

WAIST CIRCUMFERENCE AND WAIST-TO-HEIGHT RATIO REFERENCES FOR 6 TO 18 YEAR-OLD IN AUTONOMOUS REGION OF MADEIRA, PORTUGAL

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Background and Aims

Waist circumference (WC) and waist-to-height ratio (WHTR) have been associated with cardiometabolic diseases. The aim of this study was to develop WC and WHTR references for age and sex of 6 to 18 year-old in Autonomous Region of Madeira, Portugal (RAM).

Methods

Cross-sectional study, carried out in two phases. The first between May 2004 and May 2005 (in 1st cycle schools) and the second between October 2007 and June 2009 (in 2nd and 3rd cycles schools, and in secondary and professional schools). It includes a representative sample of 6987 people, with 3532 girls and 3455 boys from 6 to 18 year-old. WC was evaluated at the midpoint between the iliac crest and the last rib, height was measured according to international standards, and WHTR is the ratio between WC and height. To elaborate the smoothed percentiles and z-scores curves for age and sex, the values were estimated between 72 and 225 months (every three months) using the LMS statistical procedure, with the exponent of the Box-Cox (L), the median (M) and coefficient of variation generalized (S) through LMSChartMaker software, version 2.76.

Results

Mean and standard deviation values as well as charts of smoothed percentiles curves (P3, P5, P10, P25, P50, P75, P90, P95 and P97) and z-scores (-2, -1, 0, 1 and 2) are presented by age and sex.

Conclusions

These references constitute a new tool, specially to assess cardiometabolic risk of RAM's children and adolescents.

Poster Shift 2: Childhood & Adolescence

ARM ANTHROPOMETRY REFERENCES FOR 6 TO 18 YEAR-OLD IN AUTONOMOUS REGION OF MADEIRA, PORTUGAL

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Background and Aims

Arm anthropometry is an important approach to evaluate nutritional status. The aim of this study was to develop anthropometric references for mid-upper arm circumference (MUAC), triceps skinfold thickness (TST), upper arm muscular circumference (UAMC), upper arm total area (UATA), upper arm muscular area (UAMA) and upper arm fat area (UAFA) for age and sex of 6 to 18 year-old people of the Autonomous Region of Madeira.

Methods

Cross-sectional study, carried out in two phases. The first between May 2004 and May 2005 (in 1st cycle schools) and the second between October 2007 and June 2009 (in 2nd and 3rd cycles schools, and in secondary and professional schools). It includes a representative sample of 6987 people, with 3532 girls and 3455 boys from 6 to 18 year-old. MUAC and TST were measured using standardized procedures and UAMC, UATA, UAMA and UAFA were calculated. To elaborate the smoothed percentiles and z-scores curves for age and sex, the values were estimated between 72 and 225 months (every three months) using the LMS statistical procedure, with the exponent of the Box-Cox (L), the median (M) and coefficient of variation generalized (S) through LMSChartMaker software, version 2.76.

Results

Mean and standard deviation values as well as charts of smoothed percentiles curves (P3, P5, P10, P25, P50, P75, P85, P90, P95 and P97) and z-scores (-2, -1, 0, 1 and 2) are presented by age and sex.

Conclusions

These charts for arm anthropometry, which reflect the characteristics of this population, are useful tools in clinical settings and community practice.

Poster Shift 2: Childhood & Adolescence

THE INFLUENCE OF PRENATAL EXPOSURE TO TRANS-FATTY ACIDS FOR DEVELOPMENT OF CHILDHOOD CANCER

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Background and Aims

Industrial trans-fatty-acids (TFA) can be found in fried and industrially-processed baked foods and have been associated with negative health outcomes including cancers. Even neonates with high TFA levels show less favorable neurodevelopment and increased risk for metabolic diseases. TFA has pro-inflammatory properties and can inhibit metabolism of essential fatty-acids which might be a mechanisms behind the observed associations. Despite the alarming evidence and the fact that millions of Europeans have high TFA intake, currently no EU legislation regulates TFA. We aimed to investigate if low gestational TFA exposure, due to a TFA ban in 2003 in Denmark, decreased the offspring's childhood leukemia risk.

Methods

Denmark changed trans-fat-policy and abandoned TFA >2g/100g fat in all Danish produced and imported food since March 2003. Risk of childhood leukemia in all Danish individuals from the trans-fat exposed group born between 01.01.2000-01.03.2003, and individuals from the non-exposed group born between 01.09.2004-31.12.2007 were compared using proportional hazard ratios (HR).

Results

Among 212,041 children born 2000-2003, 110 were diagnosed with leukemia before their 8th birthday, compared to 125 among 215,216 children born 2004-2007. The HR and confidence limits adjusted for sex were 0.89(0.69;1.15) among children born in 2000-2003 compared to children born in 2004-2007. Similarly, no significant differences in the risk of leukemia were observed when investigating each year against the year where the TFA intake was highest (2000).

Conclusions

Although these preliminary analyses show no significant protective effect of the TFA-ban against childhood leukemia, further analyses considering additional confounders and biomarkers are foreseen.

Poster Shift 2: Childhood & Adolescence

SPRINKLE (TABURIA) AND EGG SUPPLEMENTATION IMPROVED COGNITIVE DEVELOPMENT AND NUTRITION STATUS OF STUNTED INFANTS

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Background and Aims

Indonesia failed to achieve MDGs targets as some provinces were still faced problems. Based on national health research baseline held on 2013, stunting was increased up to 37%. The main cause was macro and micronutrient deficiencies. Stunted was related to decline in cognitive development hence the intervention was needed. The aim of this study was to evaluate the effect of cognitive and nutrition status development on 24-48 mo stunted infants received taburia and egg every 2 days on 2 months and followed up 2 months

Methods

Experimental study was held on Sleman, special region of Yogyakarta, with the used of pre and post design. 51 infants were eligible with criteria of stunted ($-2SD < x < -3SD$) and grouped into 2. Control group was those who received taburia in single supplementation for 2 months and another group received taburia complemented with egg form the same length of period. Nutrition status measurement used Z-score and cognitive development used Stanford-Binet type LM.

Results

Infants cognitive development was improving up to 2.04 IQ points on control group ($p=0.02$) and 6.56 IQ points on group received taburia and egg ($p<0.001$). Nutrition status measured with Z-score didn't improve significantly.

Conclusions

Taburia and egg supplementation was effectively improved stunted infants (24-48 mo) cognitive development. Either single pack of taburia or complemented with egg didn't improve the body weight, height, and head circumference. As small sample size was less sensitive to detect small amount of changes.

Poster Shift 2: Childhood & Adolescence

ASSOCIATION BETWEEN NUTRITIONAL STATUS AND ACADEMIC PERFORMANCE AMONG ELEMENTARY STUDENTS AT SDN 03 PONDOK CINA, DEPOK – INDONESIA

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Background and Aims

Background. Nutritional status condition in Indonesian school-aged children is poor, so that Indonesia has been ranked as a country with low Human Development Index. Nutritional status is one of many factors that may influence academic performance.

Objectives. To find the relationship between nutritional status and academic performance among elementary students at SDN 03 Pondok Cina.

Methods

This study was held in October 2015 until September 2016 with analytical cross sectional design and 179 subjects were involved. The data were collected through body weight and height measurement, along with sociodemographic factor questionnaire and grades fulfillment. The data were analyzed by using Chi-Square test.

Results

According to BW/BH index, the majority of students had normal nutritional status (46.40%), obesity (21.20%), moderate underweight (20.10%), and overweight (12.30%). There were also more students who had low academic performance in Indonesian language (50.80%), Mathematics (53.60%), and science (50.30%) subjects. The result showed that nutritional status (categorized into normal and abnormal) had significant association with academic performance in Indonesian language ($p=0.019$) and science ($p=0.029$).

Conclusions

Nutritional status had significant association with academic performance in Indonesian language and science subject among elementary students at SDN 03 Pondok Cina.

Poster Shift 2: Childhood & Adolescence

SCHOOL-BASED PROMOTION OF FRUIT AND VEGETABLE CONSUMPTION IN MULTICULTURALLY DIVERSE, INTERNATIONAL SCHOOL

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Background and Aims

Childhood eating habits become behaviors lasting until adulthood and most of the research has also shown that children in Denmark are not eating recommended daily intake (RDI) of fruits and vegetables (FV). The study aims to identify the determinants promoting or preventing consumption of FV among 5-12 year-old multi-national students in an after school program (ASP) at Østerport International School, Copenhagen, Denmark.

Methods

Using a pre-test/post-test experimental study design, 53 children of ages 5 to 7 and 8 to 10 years old from 18 different countries were randomly selected for study. The food frequency questionnaires (FFQ) were administered before and after two-weeks nutrition education intervention. Children lunches were observed and recorded for one week before and after the nutrition education intervention. Some pre-test questions were repeated during the post-test, while others were not repeated in the post-test due to a lack of resources and time on the part of the researchers.

Results

The FFQ showed that 47% children consumed FV due to family influence and knowledge, 49% due to taste preferences (likes/dislikes), 34% due to school environment and 28% due to peer group. Among all the determinants, availability and attitude were shown to have less influence on the consumption of FV (11%). There was no evidence that repeated taste-testing of new FV resulted in children consuming more FV.

Conclusions

Nutrition education intervention can be important tool to promote FV consumption in school and to address the several factors preventing them to eat more FV in their daily life.

Poster Shift 2: Childhood & Adolescence

PRESCHOOL@HEALTHYWEIGHT; TOWARDS A HEALTHY CHILD CARE ENVIRONMENT FOR EVERY TODDLER

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Background and Aims

The prevalence of overweight and obesity among Dutch children is high, especially in ethnic and lower socioeconomic groups. Child care providers can influence the lifestyle of toddlers (2.5 to 4 years) at preschool. However, they are not trained to support toddlers (and their parents) in pursuing a healthy lifestyle. The aim of this study is to gain insight in the effect of training child care providers in supporting toddlers to pursue a healthy lifestyle on BMI and body composition of toddlers.

Methods

In this cluster randomized controlled trial, preschool locations (child care organization Impuls) in Amsterdam Nieuw-West will be randomly assigned to the intervention or control group. Child care providers on intervention locations will perform the training 'Een Gezonde Start' and 'PLAYgrounds'. With 'Een Gezonde start' they will learn how to create a healthy, active and safe environment for children. The 'PLAYgrounds' intervention will focus on stimulating outdoor physical activity of children. Height and weight will be measured to assess BMI. Bio-electrical impedance analysis will be used to assess body composition.

Results

It is hypothesized that, as a result of the interventions, toddlers will gain or maintain a healthy body weight. The study will be carried out between September 2016 and May 2018. During the conference, the protocol and baseline results will be presented.

Conclusions

The intention is to reach disadvantaged preschool children via child care providers, with the aim of promoting healthy (weight) development of children and reducing health inequalities between socioeconomic and ethnic groups.

Poster Shift 2: Childhood & Adolescence

BIOIMPEDANCE-DERIVED PHASE ANGLE IN CHILDREN WITH DUCHENNE MUSCULAR DYSTROPHY

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Background and Aims

Patients with Duchenne Muscular Dystrophy (DMD) have difficulty with walking, bone pain and changes in body composition. Treatment involves drug therapy with corticosteroids, and multidisciplinary care. Nutritional assessment of children with DMD is a challenge. In this respect, the phase angle (PA) appears to be a good parameter. However, there are no reference values for PA in this population. Thus, we aimed to investigate the PA in children with DMD, treated in a specialized outpatient facility in Natal, Brazil.

Methods

Clinical and anthropometric assessments were carried out. BMI-for-age z-score was calculated using WHO AnthroPlus. PA was calculated with resistance and reactance data, which were obtained by bioelectrical impedance.

Results

A total of 11 boys, with mean age of 9.44 SD 1.19 years, were included. The mean values were found for weight (30.1 SD 13.8 kg), height (128.9 SD 0.2 cm), BMI-for-age z-score (0.19 SD 1.63), resistance (844.6 SD 50.4 Ω), reactance (41.4 SD 10.3 Ω) and phase angle (2.94 SD 1.06 Φ).

Conclusions

The children with DMD showed low PA compared with the reference value for children of the same age with Osteogenesis Imperfecta (PA: 4.74 SD 0.93 Φ), and even lower when compared to healthy children (PA: 5.31 SD 0.64 Φ). The PA reflects the relative contribution of fluid and cellular membranes of the human body. Lower PA suggests cell death or decreased cell integrity. This parameter must be included in nutritional assessment protocols for patients with DMD and may provide useful information about the nutritional prognosis of this population.

Poster Shift 2: Childhood & Adolescence

DIETARY GLYCEMIC INDEX AND GLYCEMIC LOAD IN CHILDREN WITH PHENYLKETONURIA: THE EFFECT ON METABOLIC PROFILE

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Background and Aims

Nowadays there is no published data on daily glycemic index (GI) and glycemic load (GL) of the diet of phenylketonuric (PKU) children. The aims of this study were to examine daily dietary GI and GL and to evaluate whether an association may exist between the carbohydrate quality and the metabolic profile in PKU children on low-phenylalanine-diet.

Methods

Twenty-one PKU and 21 healthy children, aged 5-11 years (age and sex-matched) were enrolled. Daily dietary intakes, GI and GL were determined by 3-days food record. Fasting blood samples were analyzed for lipids, glucose and insulin. Triglyceride-glucose (TyG) index, reflecting muscle insulin resistance, was calculated.

Results

PKU consumed lower protein and fat and higher carbohydrate and fiber than healthy children (maximum $p=0.028$). Daily energy intake did not differ between the two groups ($p=0.570$). Compared with diet of healthy children, PKU diet had higher (mean (SD)) daily GI (62.2 (5.8) vs. 48.5 (8.4), $p<0.001$) and GL (148.2 (35.2) vs. 116.5 (33.9), $p=0.007$). PKU children exhibited lower total and LDL cholesterol levels (maximum $p=0.006$) and higher triglyceride levels ($p=0.014$) than healthy children. In PKU children there was a significant association between the GL and TyG index (Spearman's correlation coefficient=0.515, $p=0.034$), while the association with blood triglycerides was lower (Spearman's correlation coefficient=0.446; $p=0.064$).

Conclusions

Low-phenylalanine-diet could contribute to higher blood triglycerides and dietary GI, GL. An improvement towards an optimal diet for PKU children could include additional attention to the management of dietary carbohydrate quality, with a particular focus on special low protein products.

Poster Shift 2: Childhood & Adolescence

INTERRELATIONSHIP BETWEEN THE CURRENT NUTRITIONAL STATUS AND THE UNIVERSITY SELECTION TEST (PSU) OUTCOMES IN CHILEAN ADOLESCENTS.

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Background and Aims

Changes in unhealthy life styles have generated changes in the current nutritional status of adolescents, with a substantial increase in overweight and obesity which may affect scholastic achievement (SA). The aim of this study was to evaluate the interrelationship between the current nutritional status and the PSU outcomes.

Methods

A representative sample of 671 school-age children of both sexes, from high, medium and low socioeconomic strata, graduated from high school during 2013 and took the PSU tests of LA and MA, for university admission. The nutritional status was expressed as body mass index (BMI, weight/height²) compared to the NCHS-CDC tables and expressed as Z-BMI. SA was measured with the PSU scores both language (LA) and mathematics (MA), provided by the Research Department of the Ministry of Education. The data were analyzed with the STATA 12 software.

Results

About 51% of men, and 60% of women had a normal Z-BMI and 32% of males and 36% of females presented overweight and obesity, at the onset and at the end of high school ($P<0.01$; $P<0.05$, respectively). PSU scores both LA and MA significantly differed according to Z-BMI only at the end of high school ($F= 4.41$, $P<0.01$ and $F= 5.18$, $P<0.01$, respectively) since adolescents who were obese achieved lower PSU results.

Conclusions

The current nutritional status is an anthropometric indicator susceptible to be modified at the onset of high school. This could encourage the improvement of SA at the end of high school.

Grants FONDECYT 1100431 and 1150524

Poster Shift 2: Childhood & Adolescence

EFFECTING CHILDREN'S PREFERENCE USING SENSORY ASPECTS TO INCREASE FOOD CHOICE FOR HEALTHY SNACKS

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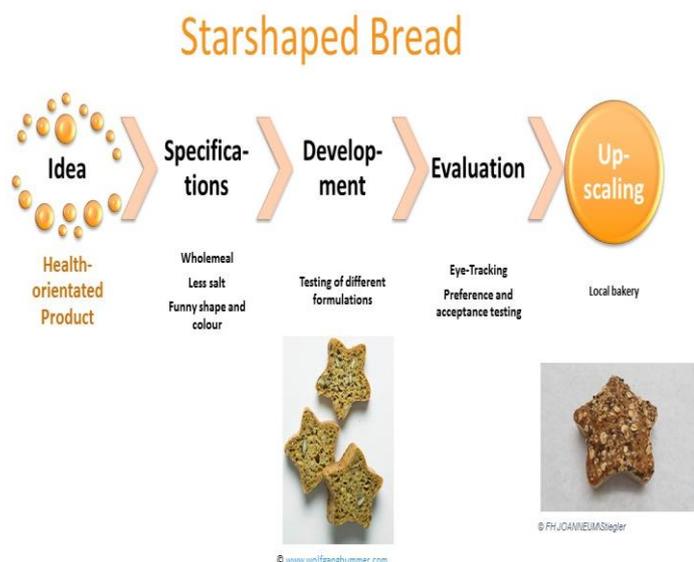
Background and Aims

Customised sensory properties concerning taste as well as appearance might help children make healthier food choices of healthy snacks by a raised attractiveness of foods.

So, we interdisciplinarily developed a sensorily attractive wholemeal bread which was evaluated by children.

Methods

Product development (Fig. 1) was performed based on specific product requirements (e.g. wholemeal, salt and oil seed content, attractive shape and colouring). 38 children (7-10 years) were invited to test different types of bread (star-shaped vs. common form, yellow coloured vs. common bread colour, wholemeal vs. refined meal bread) which were analysed by eye-tracking (Tobii® Eye Tracker X2-60), preference and acceptance testing.



Results

The star shape was preferred (63.2%) when compared to the common bread (36.8%, $p=0.143$). The coloured versions of the bread were chosen less often (18.4%) compared to common brown bread (81.6%, $p<0.000$) (Fig. 2). Although, 44.7% preferred white bread and 53% don't eat wholemeal bread regularly, the acceptance of the star shaped bread was high:

76.3% rated the bread good or very good in terms of taste ($p < 0.000$).

Results of Eye-Tracking und Preference Test (N=38)

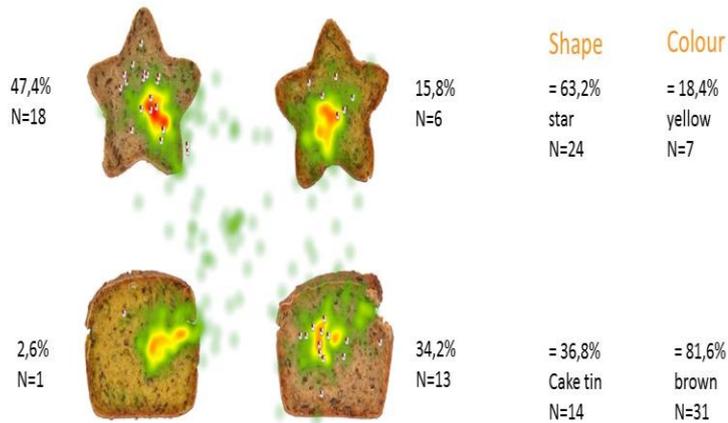


Fig. 2: Food choices made by children and fixations measured with Eye-tracking (indicated as coloured fields-the darker the more fixations), small dots on pictures represent explicit choices of children

Wrank Birgit, 2016

Conclusions

The modified colour was not accepted by the children, indicating natural brown bread colours are preferred in the testing group. We further conclude that the children like an attractive child-oriented bread-style, which could help children making a healthier food choice.

Poster Shift 2: Childhood & Adolescence

ANALYSIS OF BREAKFAST HABITS OF CHILDREN AGED BETWEEN 10-15 YEARS IN A SELECTED PRIVATE INTERNATIONAL SCHOOL IN COLOMBO SRILANKA AND CORRECTIVE RECOMMENDATIONS

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Background and Aims

It is a known fact that the breakfast, which is recognized as the most important meal of the day, should not be skipped. In the case of schooling children, there may be a possibility that the busy morning schedule may exert a pressure on parents and children to skip the breakfast altogether. At least, it may have an impact on choosing the type of the breakfast.

The main objective of this study was to analysis the breakfast habits among international school children aged between 10-15 in Colombo, Sri Lanka and give corrective recommendations.

Methods

This is a descriptive cross sectional study, randomly selected 500 students, age between 10 to 15 years old, studying in 6th, 7th, 8th and 9th grades. Data collected through self administrated questionnaire.

Results

It was found that a half of the children subjected to the current study omitted breakfast routinely. Only one third had a regular breakfast. The majority indicated that they were aware of the importance of consuming breakfast and that they felt hungry in the morning. The vast majority.

Conclusions

Including the breakfast skippers, stated that lack of time as a factor that had the main negative impact on having breakfast routinely. The current study recommended allocation of a time slot for breakfast in the morning time table at the school.

Poster Shift 2: Childhood & Adolescence

MAKING STRIDES IN THE MANAGEMENT OF DIABETES: BREAKING CULTURAL BARRIERS THROUGH TECHNOLOGY

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Background and Aims

To Investigate and Attempt to Correlate the Cultural Transcend of Diabetes Education to Developing Countries using the International Diabetes Federation (IDF) Atlas for Comparing global statistics on Diabetes Incidence and Prevalence with audience reached by ***Pediatric Diabetes and Nutrition Advocate page***. The use of Technology to find Diabetes treatment information is becoming increasingly popular.

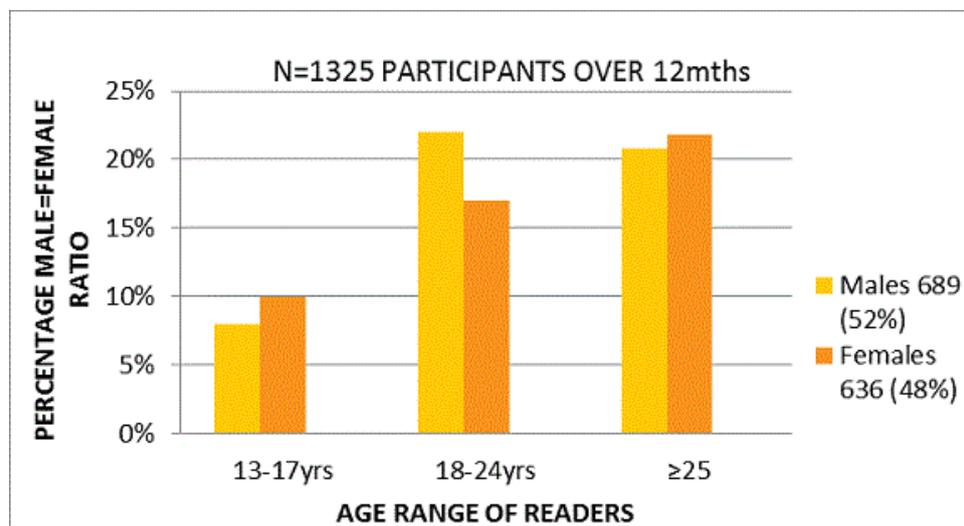
Methods

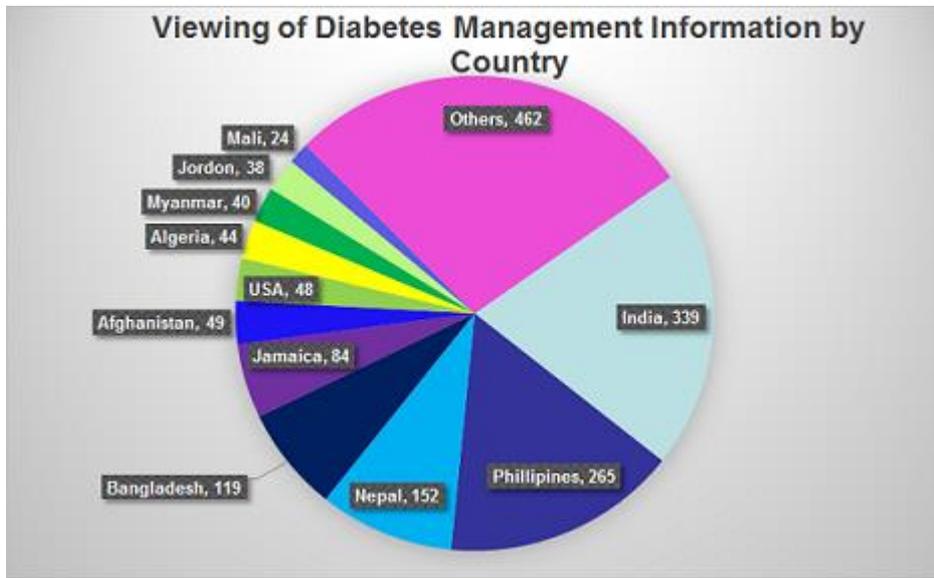
An advocacy page was created in February 2014 to share practical information on DM researches, exploring different management options; pulling from various journals, research organization websites, and company publications on developments in therapeutics, monitoring and care devices. Readers were able to access information freely on Nutrition for DM Management and numerous research findings. After collating the data; a correlative analysis was done using scattered plots and regression predictive model to determine whether the groups, gender and location of the audience reached by information posted was comparable with IDF Atlas of regions with high incidence and prevalence of Diabetes.

Results

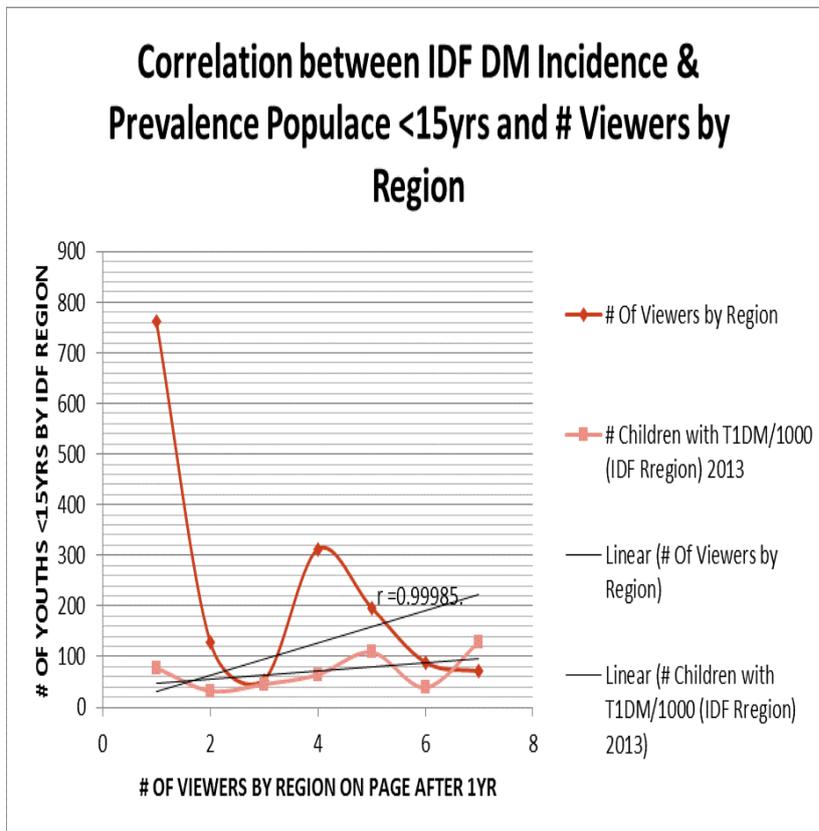
Statistical analysis revealed demographic data at 6mths: **n=118** viewers:
Males n= 33(28%) visited compared to Females n=85(72%)

N=118(6mths)	13-17yrs	18-24yrs	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65+
Males 33 (28%)	1.6	5.93	3.39	5.93	5.93	4.24	0.847
Females 85 (72%)	0.874	5.93	33	16.9	6.78	3.39	5.08





India with the highest viewership $n=339$, Philippines 265 (20%), Nepal 152 (11.47%), Bangladesh 119 (8.98%), Jamaica 84 (6.34%)



Conclusions

Diabetes advocacy through technologically innovative means provide permanent access to adequate information and has proven to transcend location, age and culture. There is a positive correlation between audience reached and IDF Atlas of regions with increased prevalence.

Poster Shift 2: Childhood & Adolescence

MALNUTRITION IN CHILDREN WITH PRIMARY IMMUNODEFICIENCY DISORDERS. A SINGLE-CENTER ALGERIAN CASE SERIES

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Background and Aims

Primary immunodeficiency disorders (PID) are a group of genetic disorders characterized by an abnormal immune system leading to increased susceptibility to severe infections. The aim was to determine the frequency and characteristics of malnutrition in a group of Algerian children with PID

Methods

Records of children with diagnosis of PID followed in our department between 2000 and 2015 were included. We evaluated demographic, clinical (including anthropometric data with use of z-scores from the WHO anthroplus v.1.0.4 software of WHO) and biological data at diagnosis and mortality

Results

We studied 61 children, aged between 4 months and 14 years, in whom symptoms (Pulmonary infections 52.5% - Diarrhea 23%) started between 1 month and 8 years of age. The diagnosis was a combined ID 21.3%, syndromic ID 11.4%, predominantly antibody deficiency 50.8%, disorder of phagocyte function 14.7%. Evaluation of anthropometric indices showed malnutrition according to "weight / age" in 37.7%, to "height / age" in 31%, to BMI in 26.2%, whatever the index in 52.5%. Malnutrition was more frequent and severe in females with a trend to associate it to MHC II deficiency, syndromic ID and disorder of phagocyte. Tests showed anemia in 57.3% and hypoalbuminemia in 2/25 patients. Mortality (26%) was higher in malnourished patients and in MHC II deficiency, severe combined ID, chronic granulomatous disease

Conclusions

Decreasing mortality of children with PID and improving their health require early diagnosis and assessment of nutritional status to prevent or treat any malnutrition

Poster Shift 2: Childhood & Adolescence

LONG-TERM PARENTERAL NUTRITION INFLUENCES GROWTH IN CHILDREN

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Background and Aims

Chronic intestinal failure often requires long-term home parenteral nutrition (HPN). In children on HPN, a major goal is to obtain optimal growth. Children before pubertal period are particularly vulnerable to the effects of nutrient deficiency which may delay appropriate growth.

Mean values of body height and weight in patients on Home Parenteral Nutrition (HPN) and general population were compared.

Methods

The analysis of body height and body weight was performed for 45 patients on HPN (18 girls and 27 boys; mean age 7.3 years for girls and 6.3 years for boys). All observed patients have been on HPN from neonatal period for 3 years and received HPN minimum 4 days per week. The data from measurements of the gender groups was divided into chronological age classes and presented on Polish reference charts. Two-tailed t-tests were used to compare mean values for body weight and height between patients on HPN and the general population.

Results

Mean values for body height and body weight in HPN patients were lower than in general population. The difference was statistically significant in almost all calendar age classes.

Conclusions

Growth of children on HPN is impaired in comparison with healthy population.

Poster Shift 1: Infancy

PREDICTORS OF CATCH-UP GROWTH AND RISK OF OVERWEIGHT AND OBESITY IN THE FIRST 6 MONTHS OF LIFE: PRELIMINARY FINDINGS FROM A MALAYSIAN COHORT STUDY

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Background and Aims

Catch-up growth in infancy has been associated with higher risk of obesity and metabolic disorders. This study aims to determine the predictors of catch-up growth and risk of overweight and obesity in the first six months of life of Malaysian infants.

Methods

These are preliminary findings of an on-going cohort study of infants from birth to 2 years in Malaysia. The present analysis includes 268 infants who had been followed-up until 6 months of age. Socio-demographic background and infant feeding practices were obtained from mothers using questionnaires. Mother's pre-pregnancy BMI, gestational weight gain, present of gestational diabetes, infant's gestational age and birthweight were obtained from patient card. Infant's weight and length at 6 months were measured. Z-scores of weight-for-length (WLZ), weight-for-age (WAZ) and length-for-age (LAZ) were determined using WHO Anthro software. Catch-up growth is defined as difference of more than 0.67 in the WAZ between 6 months and birth.

Results

The prevalence of catch-up growth was 34.7%. Birthweight and mother's age during pregnancy were found to be significant predictors of catch-up growth. Low birthweight infants (OR=68.44, 95% CI=7.08– 661.40) and infants born to mothers aged above 35 years (OR=2.47, 95% CI=1.12–5.42) had higher risk of catch-up growth. Infants who experienced catch-up growth were also found to have higher risk of being overweight or obese at 6 months of age (OR=2.55, 95% CI=1.26–5.16).

Conclusions

Pregnancy after the age of 35 years and low birthweight may pose a higher risk of catch-up growth among Malaysian infants, and may lead to overweight and obesity.

Poster Shift 1: Infancy

AN INNOVATIVE INFANT FORMULA WITH LARGE, PHOSPHOLIPID-COATED LIPID DROPLETS AND MILK FAT IS WELL TOLLERATED AND HAS A STOOL-SOFTENING EFFECT

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Background and Aims:

Inspired by human milk, an innovative infant formula was developed using a milk fat blend and comprising large, phospholipid-coated lipid droplets (NUTURIS®). In the randomised, double-blind, controlled, prospective, multi-country clinical trial MERCURIUS, safety and adequate growth support were previously demonstrated. Aim of the current study was to evaluate the potential effects on gastrointestinal (GI) symptoms and stool consistency.

Methods:

Healthy term infants (n=223) were randomised before 35 days of age to receive a standard infant formula comprising small lipid droplets made with a vegetable oil blend (CONTROL) or NUTURIS until 17 weeks of age. Exclusively breastfed infants (for ≥ 13 weeks, n=88) served as reference. Each month, a 7-day diary was kept recording the severity of GI symptoms (absent-mild-moderate-severe) and stool consistency (watery-soft-formed-hard). The probabilities of GI symptom severity and stool consistency were analysed by a longitudinal non-proportional odds model.

Results

NUTURIS did not affect the probability of severity of cramps, nappy rash and regurgitation compared to CONTROL during the intervention period. The probability of having moderate and severe vomiting in the NUTURIS group was low and comparable to the breastfed group while it was even lower for CONTROL. Subjects on NUTURIS had higher probability of having softer stools compared to CONTROL. The overall distribution of stool consistency probabilities in NUTURIS group was more similar to observations in the breastfed group.

Conclusions

This study shows that the newly developed infant formula, based on a milk fat blend and comprising large, phospholipid-coated lipid droplets (NUTURIS®) is well tolerated and has a stool-softening effect.

Poster Shift 1: Infancy

DISTRIBUTION OF THE CALCIDIOL VALUES ACCORDING TO THE MODE OF FEEDING IN YOUNG ALGERIAN CHILDREN

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Background and Aims

Since antiquity, the rickets existed, affecting the children living in poor and sparsely sunny regions. Milk was selected as the food main component which must be enriched with vitamin D to prevent the rickets. The breastfeeding, which was considered for a long time as satisfying on the vitamin and calcium levels, now appears insufficient to cover the infant needs in vitamin D.

Methods

The study was carried out in Blida (Northern region, Algeria), Sampling focused on 124 healthy children, aged between 1 and 23 months, recruited in the Ben Boulaïd hospital pediatrics services. These children were divided into three groups depending on their feeding mode. Vitamin D (25 OHD) was measured by HPLC.

Results

The mean values of 25 (OH) D are respectively 36.42 ± 20.55 µg/L in the children group fed only with breast milk (n = 27), 48.30 ± 24.00 µg/L in the children group who receive a mixed feeding (n = 23) and 48.24 ± 18.08 µg/L in the children group breastfed with artificial milk (n = 74). The difference is only significant (P < 0.05) between the groups of children fed with breast milk and artificial milk.

Conclusions

The prevalence of vitamin D deficiency (25 (OH) D < 20 µg/L) is lower (4%) in children fed with artificial milk fortified with vitamin D compared to the children fed with breast milk (30%). The current vitamin D fortification of milk adapted at first and second age contribute to improve vitamin D status of children and to reduce deficiency rickets.

Poster Shift 1: Infancy

ETHNIC DISPARITIES OF STUNTING AMONG CHILDREN FROM RURAL AND URBAN AREA IN THE COUNTY OF GREATER NUTRITIONAL RISK IN THE BRAZILIAN AMAZON

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Background and Aims

Stunting presents complex etiology involving social, cultural and genetic factors which are influenced by the ethnic condition of the child. The study objective identify differences in the associated factors with stunting according to ethnic group.

Methods

A population-based, cross-sectional study was performed in a random sample of 838 children aged <5 years living in Jordão, western Brazilian Amazon. Data from structured socioeconomic, health and food frequency assessment questionnaires, anthropometric measurements, blood and stool samples were used in Poisson regression models to estimate prevalence ratios (PR) according to a hierarchical conceptual framework.

Results

The Prevalence of stunting was 69.3% (95%CI:64.9;73.3%) and 21.9% (95%CI:17.8;26.6), in the groups with and without indigenous ancestry, respectively. We found a heterogeneous scenario for the associated factors according to the child's ethnic group. Among children with indigenous ancestry, highlights the incorporation of practices linked to contact with the surrounding society as alcohol consumption during pregnancy (PR:0.79;[95% CI:0.71;0.88]), pacifier use [PR:1.1;[95%CI:1.0,1.2]] and not introduce of cow's milk in the child's diet (PR:0.7;[95% CI:0.5; 0.9]), with factors associated with stunting. As for children without indigenous ancestry stood out the variables related to pregnancy as high blood pressure (PR:2.0;95%CI1;1:09;1:40) and birth interval <24months (PR:2.2; [95%CI:1.1;4.6]) in addition to the early introduction of semi-solid feed (PR:1.7;[95% CI:1.1;2.5]).

Conclusions

Despite an apparent similarity, the confrontation of the stunting in these minority segments of the population, need to take into account its specificities even in places apparently homogeneous as observed in the countryside of the Amazon region.

Poster Shift 1: Infancy

SEVERE FOOD INSECURITY IS ASSOCIATED WITH STUNTING IN CHILDREN UNDER FIVE OF PANAMANIAN RURAL COMMUNITIES

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Background and Aims

The Agricultural Research Institute of Panama (IDIAP) is implementing a project to promote biofortified high micronutrient content crops such as rice, maize, sweet potatoes and beans, but have not been well studied the food and nutritional security status among beneficiaries, particularly in children under five. **Aims:** To explore the association between severe food insecurity (SFI) and Stunting among children <5y in Panamanian rural communities.

Methods

A cross-sectional study of 135 children <5y was conducted from June-September 2015 in two geographically dispersed rural area (non-indigenous: Sona, Ola, Los Pozos; and indigenous: Nole Düima and Müna). We collected information on household food insecurity, months of adequate household food provisioning (MAHFP), anthropometric measurements, and socio-demographic data and ran descriptive and multivariate analyses, controlling for fixed effects of area and using robust standard errors.

Results

Mean age \pm SD of participants was 33.7 \pm 18.2 months; 50% were female, and 55% were from indigenous area. Mean \pm SD for HAZ and BAZ were -1.16 \pm 1.34 and 0.66 \pm 0.99, respectively. A total of 44% reported SFI. After controlling for MAHFP, age, and gender, SFI was associated with decreased (β =-0.83, p=0.002) and area (indigenous vs non-indigenous) (β =-0.86, p=0.001). Age was also associated with decreased HAZ (β =-0.016, p=0.003). Both HAZ and BAZ were correlated with severe food insecurity, Spearman rho=-0.48, p=0.000 and rho=0.30, p=0.000, respectively. After controlling by all covariates, area was associated with BAZ (β =0.54, p=0.002).

Conclusions

SFI is associated with HAZ among children under five year olds residing in these Panamanian rural communities. Nutritional interventions should incorporate biofortified crop production among the most vulnerable groups.

Poster Shift 1: Infancy

AN IN VITRO GASTROINTESTINAL MODEL FOR STUDYING THE NUTRITIONAL QUALITY OF INFANT FORMULAS FOR IMPAIRED INFANTS

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Background and Aims

To ensure appropriate growth and development of infants, it is important to evaluate the nutritional quality of infant formulas. Nutrient uptake and digestion is impaired in the presences of gastrointestinal disorders, such as gastroesophageal reflux, which require adaptation of the regimen and diets. Whether or not these adapted regimens and diets fulfil the nutritional requirements of infants is crucial.

This difficult to appropriately evaluate, because of the vulnerability and of course ethical constrains of this population group. Appropriate evaluation should include age-related changes in gastrointestinal conditions, since these impact digestion and uptake of nutrients and pharmaceutical dosage forms.

We describe the development, validation of an advanced gastric compartment (AGC) connected to the in vitro system of the small intestine (TIM) for evaluating the gastric behaviour of thickened infant formulas designed to counteract gastroesophageal reflux and the nutritional quality (digestibility).

Methods

Experiments to measure in situ the rheological behavior of meals are performed in the advanced gastric compartment of the TIM platform (TIMagc) that realistically simulates gastric shape and motility and the consequent forces that are applied to dosage forms and food. Further gastrointestinal conditions are set to mimic infant conditions.

Results

Results will describe the (intra-gastric) rheological behavior of infant formulas designed for gastroesophageal reflux, when realistic gastric secretion, gastric emptying and gastric pH is applied.

Conclusions

The TIM advanced gastric compartment allows the evaluation of the gastric behavior and nutritional quality of formulas intended for impaired infants.

Poster Shift 1: Infancy

HOW WELL SHOULD HEALTHY TERM INFANTS GROW ON EXTENSIVELY HYDROLYZED (EHF) AND AMINO ACID-BASED(AAF) INANT FORMULA?

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Background and Aims

Past studies have questioned growth of infants fed EHF formulas. Recent data have reported growth on EHF and AAFs from larger, controlled, randomized studies. The aim of this project was to review and assess the available growth data compared to current growth standards.

Methods

8 studies were assessed; 6 studied EHF and 4 AAFs. Studies enrolled healthy, term, exclusively formula-fed infants from 14 d until 112-120 d of age. 4 EHF and 4 AAFs were assessed.

Results

All studies assessed growth of >52 infants per group except 1. Growth on all EHF/AAF did not appear equivalent. Infants clearly grew better on 2 of 4 EHF and 2 of 4 AAFs. For 2 EHF, healthy infants were unable to maintain mean birth weight (wt) percentiles of 50% with means of males dropping as low as the 31st and 25th percentiles during the study. Like EHF, mean infant wt on 2 AAFs were closer to the 50th percentiles than those on the other 2 AAFs. Mean male wt percentiles on 1 AAF ranged from the 30th – 37th percentiles.

Conclusions

Since healthy term infants were assessed, expectations were that mean growth would track near the 50th percentile. Results of this review suggest that infants do not grow the same on all EHF and AAFs. Potential causes for these growth differences will be presented. Thus, care should be taken when selecting an EHF or AAF for compromised patients. (Supported by Abbott Nutrition, Abbott Laboratories)

Poster Shift 1: Infancy

EATING HABITS IN CHILDREN AGED 0-7 YEARS

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Background and Aims

Dietary practices concern all activities around what is produced, exchanged, given, sold, purchased, prepared, processed, consumed, ingested, all that is objectively and subjectively thought and lived (Calvo 1983). Eating habits was power balance product, hence importance of referring to economic, social, identity and symbolic conditions that carry the act of eating in children aged 0-7 years.

Methods

Survey consisted of 60 interviews, and focus group gathered mothers in precarious and in middle-class allowing identify mother representations about their child anemia or obesity.

Results

A middle-class stylefood own was noted as healthy and taken food chronology, instead of common meal. High class characteristics were less pronounced, oscillating between middle-class practices and craft with what was done in other countries. Mothers in precarious youth had 3 or more children and suffered with their children from anemia. Mothers preferred bread and milk or milk and cookies, and potato when foods were introduced at 7 months. Mothers of middle-class and those in prosperity didn't breastfed beyond 6 months. Middle-class mothers favored yogurt consumption, and masked taste of vegetables by cheese. They associated their children for food choice, and were concerned about complementary food to counter anemia or overweight. They allowed fresh local fish products, shrimp, preferred to give seasonal fruits. Mothers monitored their child weight as a sign of good health by consuming concentrated foods.

Conclusions

Fluctuating incomes in poverty, lead households to prefer subsidized food as child diet basis. Foodstyle of middle-class depends on what Algerian State consents to import or encourages production.

Poster Shift 1: Infancy

IRON DEFICIENCY AND DIETARY CONSUMPTION IN INFANTS AGED 18-24 MONTHS

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Background and Aims

Iron deficiency in the first two years may cause irreversible deficits in cognitive development, among other potential adverse effects. The aim of this study was to evaluate dietary consumption and iron deficiency in infants.

Methods

Infants (n=132, B/G, 74/58) aged 18 to 24 months, were recruited in three pediatric consultation and immunization centers of Oran. Dietary consumption by the "24H recall" followed by 3 days record was evaluated. Fresh blood count, plasma ferritin, and soluble receptors of transferrin (RsTf) were measured.

Results

Body mass index was of 17 ± 2 , with 6% underweight, 29% overweight, and 8% obesity. Middle socio-economic level characterized 68% of families. Total energy intake (959 ± 268 Kcal/d) was similar to the recommendations (900Kcal/d). Intakes of protein (17%) and carbohydrates (55%) were high, while that of lipids (28%) was decreased, compared to recommended values. Animal proteins (68% of total proteins) and simple carbohydrates (50% of total carbohydrate) were high, compared to recommendations. Iron intake of 4.97 ± 3 mg was reduced compared to recommended value (7mg), showing that 81.6% of infants were deficient. Anemia was present in 47% of infants (Hb<11g/dL). Iron deficiency was defined according to several models: 22.1% met model criteria of ferritin<12µg/L and 72.6% with low ferritin or high RsTf or low mean corpuscular volume.

Conclusions

Dietary imbalance is probably at the origin of some micronutrients deficiencies, in particular iron leading anemia in half of infants. It is necessary to sensitize mothers to well monitoring and diversifying feeding of their infants, thus ensuring dietary balance for their growth and development.

Poster Shift 1: Infancy

LOW COST BODY COMPOSITION MEASUREMENT FOR NUTRITION ASSESSMENT USING NEAR INFRARED (NIR) LIGHT REFLECTION FROM BIRTH UP TO 2 YEARS

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Background and Aims

Malnutrition has typically been managed through weight and length / height measurements. There is now greater recognition to understand body composition status as a means of identifying and addressing malnutrition. However, there is a lack of convenient and low-cost body composition devices available. The aim of this study was to determine how well near infrared (NIR) light reflection (low-cost device) predicts body composition with reference to criterion methods. We report on early model development using a preliminary data set from ongoing data collection in Soweto, South Africa.

Methods

Subjects recruited were mothers with term infants aged from birth (≤ 48 hours) to 2 years. Measurements were conducted at a research centre at the Chris Hani Baragwanath Academic Hospital in Soweto. Anthropometric measurements including weight, length, skinfolds and circumferences were undertaken. Near infrared (NIR) measurements were taken at 4 sites (subscapular, flank, triceps and thigh). Body fat was measured using dual x-ray energy absorptiometry (DXA). Models for the estimation of body fat were fitted using anthropometric features and wavelength combinations from NIR light reflection.

Results

A total of 77 infants were included in the analysis. A model developed using 3 ratios of % NIR reflection at a given wavelength combined with weight and sex yielded a correlation R-squared of 0.667 ($p < 0.001$) and RMSE 5.8%.

Conclusions

Preliminary results demonstrate potential for further model development, using NIR reflection. Further evaluation and comparisons to criterion methods are required on the larger data-set once data collection has been completed.

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Poster Shift 1: Infancy

PLANT-BASED GALACTO-OLIGOSACCHARIDES SUPPORT ADEQUATE GROWTH AND HAVE PREBIOTIC PROPERTIES IN PRE-WEANING PIGLETS

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Background and Aims

Cow's milk-based Galacto-OligoSaccharides (GOS) are added to infant formulas as prebiotics to improve gut and immune functions but their use in infant formulas intended to manage cow's milk allergy (CMA) or lactose intolerance is not possible due to their intrinsic nature. In this study, the tolerance and prebiotic properties of a lactose-free plant-based GOS (P-GOS®) were evaluated in pre-weaning piglets.

Methods

24 male and female pre-weaning farm piglets (Yorkshire Crossbred) were offered a standard or P-GOS® enriched (8 g/L) formula for 3 consecutive weeks. Growth, food intake and clinical observations were monitored throughout the study period. Animals were sacrificed at the end of the intervention period to sample vital organs and intestinal contents.

Results

Body weight, body weight gain, food consumption and feed efficiency were similar in P-GOS® and control groups. When compared to controls, animals supplemented with P-GOS® had increased cecum-colon weight ($p=0.05$), total bacteria ($p=0.04$) and bifidobacteria ($p=0.03$) counts in the colon, while lactobacilli counts were unaffected. Cecum and colon contents displayed lower pH in the P-GOS® group vs control ($p=0.03$ and $p=0.01$, respectively) while lactate concentrations were similar. Concentrations of the short-chain fatty acids butyrate ($p=0.01$) and acetate ($p=0.02$) were increased in the P-GOS® group vs control while propionate was not affected.

Conclusions

P-GOS® is well tolerated, supports adequate growth and has prebiotic properties in pre-weaning piglets. It represents an alternative to existing prebiotics for infant formulas intended to manage CMA or lactose intolerance.

Poster Shift 1: Infancy

THE RISK FACTORS OF POOR OUTCOME OF PREMATURE NEWBORNS MANAGEMENT

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Background and Aims

To identify risk factors determining the outcome of premature newborns management.

Methods

Retrospectively studied 142 infants. At the time of investigation, the age of children was from 3 to 4 years. The first comparison group included children born at 24-32 weeks gestation. The second group included children born in gestation more than 32-36 weeks.

Results

The frequency of abnormality in the first group was 53.8 per 100 tested children, in the second group - 29.2 per 100 tested children. However, correlation analysis did not allow confirming a judgment about the high frequency of abnormality and earlier gestational age. Therefore, it is not the only risk factor and the study of the complex of risk factors is required.

The frequency of abnormality in the groups of children with a birth-weight below 1500 grams and more than 1500 grams were 66.7% and 25% respectively. The association coefficient was 0.71, indicating a strong dependence of the probability of developing pathology at an early age on the body weight at birth.

The application of IVF (assisted reproductive technology) significantly associated with the development of the pathology at an early age. In addition, the low rate of weight gain, the functioning aortic duct, convulsions and long-term (more than 25 days) artificial lung ventilation may be risk factors.

Conclusions

Such pregnancy complications as a threat of interruption of pregnancy, preeclampsia and infections did not correlate with the frequency of abnormality at an early age.

A complex of risk factors defines the probability of abnormality in premature newborns.

Poster Shift 1: Infancy

FOOD CONSUMPTION SURVEY IN A SAMPLE OF 0-3 YEARS OLD TAIWANESE CHILDREN

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Background and Aims

Infants and toddlers are entirely dependent on their parents for providing them with nourishment, the food that parents choose to feed their children may influence the children's growth and future health. Food selection for infants and toddlers are culturally sensitive. Understanding food consumption pattern of Taiwanese babies helps health professionals providing adequate nutrition counseling services to the parents. The aim of this study was to describe food consumption pattern in a sample of Taiwanese 0-3 years old children.

Methods

Data were from a 3-year sleep and development longitudinal survey study. In the original study, a convenience sample of 178 healthy birth cohorts born in a medical center located in the northern Taiwan were recruited and followed for 3 years. Completed food data from 156 subjects were analyzed. Food data were recorded semiyearly for 4 days until the babies reached 3 years old.

Results

Most 0-6 months old babies were fed with breast milk exclusively (57%), followed by mixed-fed (38%, formula and breast milk), and formula fed (5%). There were 60% infants introduced solid foods at age 6 months, and the most common solid foods were apples, rice porridge, and rice cereal. Children older than 6 months started to eat starchy foods (rice porridge, cereal, toast, cake, radish cake...etc.), and only 40% of them ate vegetables or fruits daily during ages 1 to 3.

Conclusions

Taiwanese parents usually feed their babies with limit choices of food. Health providers should encourage parents to offer a wide variety of vegetables and fruits daily to their babies.

Poster Shift 1: Infancy

DIFFERENCES IN BREASTMILK HORMONE AND CYTOKINE CONCENTRATIONS IN WOMEN WITH AND WITHOUT GESTATIONAL DIABETES AND THEIR RELATIONSHIP TO INFANT BODY COMPOSITION: A PILOT STUDY

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Background and Aims

Maternal diabetes increases neonatal adiposity and is thought to increase the risk of child obesity. One understudied mechanism is “lactational programming,” or the transmission of hormones, cytokines, and other potentially bioactive constituents in breastmilk. While this has been shown in numerous animal models, the human literature is still unclear.

Methods

A total of 45 exclusively breastfeeding non-smoking mother-infant dyads (N=8 GDM/37 non-GDM; N=31 White) were enrolled in pregnancy and attended a study center visit at 1 month postpartum, at which they provided a single complete breast expression. The milk fat was separated from the aqueous phase by centrifugation. Milk insulin, milk TNF-alpha, and milk IL-6 were assayed in the skimmed milk using commercially-available immunoassay kits. Infant anthropometrics and total body fat mass, fat-free mass, and percent body fat were assessed using dual energy x-ray absorptiometry (DXA) at 1 month.

Results

Median milk IL-6 (3.67 pg/mL vs. 41.9 pg/mL, $p=0.0018$) and median milk insulin (451 pg/mL vs. 2670pg/mL $p=0.0041$) were significantly higher in mothers with GDM compared to non-diabetic mothers. Maternal GDM status ($p=0.0429$) and higher breast milk insulin levels at one month ($p=0.0322$) were significantly associated with lower infant recumbent length at 1 month, and breast milk insulin was also negatively associated with infant fat-free mass at 1 month ($p=0.0213$).

Conclusions

We observed differences in breast milk between diabetic and non-diabetic women with insulin negatively impacting both length and fat-free mass. Though early, this proof of concept study suggests a potential window for child obesity risk during the period of breastfeeding.

Poster Shift 1: Infancy

FORMULA FEEDING IS ASSOCIATED WITH EARLIER INTRODUCTION TO SOLIDS AND RAPID CHILD GROWTH IN THE STRONG KIDS2 COHORT

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Background and Aims

Early child feeding contributes to rapid child growth. This study aimed to investigate child growth in the first year-of-life according to milk feeding: exclusive breastfeeding (BF), exclusive formula feeding (FF), combined feeding (CF) and timing of introduction to solids (ITS).

Methods

Data was collected from the STRONG Kids2 cohort. About 81% of mothers are White, 5% Black, 3% Hispanic/Latino, 82% married, 71% college educated and 66% overweight/obese. Child weight-for-length/height z-scores (WFLZ) were calculated using 2006 WHO charts. Change in mean WFLZ (month 12-3) was analyzed using the paired t-test.

Results

Proportion of children with ITS before 6 months was higher ($P=0.005$) among CF (24%) and FF (21%) than BF (8%) infants. WFLZ change was greater ($P<0.0001$) for FF (1.2 ± 1.4) and CF (1.3 ± 1.1) than BF children (0.7 ± 1.4), based on feeding at month 3. For children with ITS on/after 6 months, WFLZ change was unaffected by milk type. Compared to ITS after 6 months, children, WFLZ change was significantly different for FF (0.8 ± 0.9 ; $P=0.048$) and CF (1.8 ± 0.9 ; $P=0.007$) children, but was smaller and non-significant among BF children (0.5 ± 1.1 ; $P=0.116$) with ITS before 6 months.

Conclusions

FF and CF children grow more rapidly between 3 and 12 months and are fed solids earlier than BF children. BF protects against weight gained when solids are introduced <6 months. Children's milk intake and ITS timing are modifiable factors presenting opportunities for educational programs aimed at reducing rapid child growth in the first year-of-life. (Funded by Dairy Research Institute and Gerber Foundation).

Poster Shift 1: Infancy

DETERMINANTS OF STUNTING IN ZAMBIA IN CHILDREN UNDER 5 YEARS OLD. WHERE IS IT MORE LIKELY TO HAPPEN, URBAN OR RURAL AREAS?

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Background and Aims

In Zambia, 40% of children under age 5 are stunted. Findings from this study can be useful to public health researchers and policy makers in reviewing and designing new intervention strategies aimed at reducing the number of chronically malnourished children.

Methods

The data examined were from the Zambia Demographic and Health Survey 2013-14. The variables from the survey were classified into 2, according to the Household general characteristics and the Mother and Child characteristics. Regarding the statistical analysis, the outcome variable was stunting (3 categories: not stunted, stunted and severely stunted). Univariable ordinal logistic regression analysis was undertaken (cut of point of P-value 0.05). With the results of the univariable analysis, a multivariable ordinal logistic regression model was run in order to find the variables that were significantly related to the prevalence of stunting.

Results

Chronic malnutrition seems more likely to happen in urban areas than in rural residences. Stunting becomes more apparent as children grow older, and is more likely to affect males. Low birth-weight, mother's BMI, mother's education, mother's age at birth or age of first marriage, were also potential risk factors, since they showed a significant association with stunting. In addition, belonging to a poor wealth quintile or having access to health facilities (place of delivery) were also significantly associated with both severe and moderate forms of stunting.

Conclusions

This analysis revealed that chronic malnutrition is more likely to happen in urban than in rural areas, which is the opposite of what was being reported until now in Zambia.

Poster Shift 1: Infancy

EXPOSURE AND PERCEPTION OF VEGETABLES IN PRE-SCHOOL CHILDREN

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Background and Aims

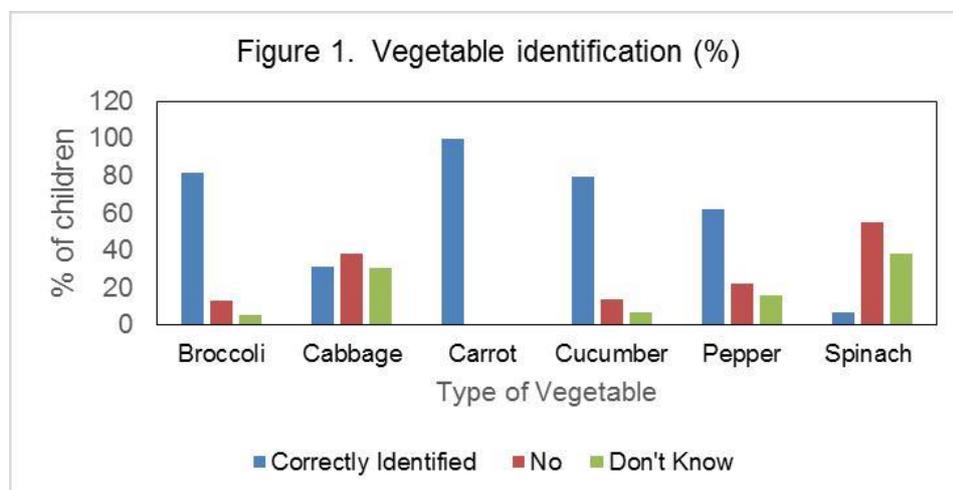
Low vegetable intake in childhood is of public health concern. Increased exposure in infancy is important to increase intake. We aimed to explore children's exposure and perceptions to vegetables in early year's settings.

Methods

A cross sectional study of preschool children (n=400) aged 3-5 years across 12 nurseries located in areas of socioeconomic deprivation in North Lanarkshire, Scotland were shown a variety of vegetables (carrot, cucumber and broccoli -common vegetables- and cabbage, pepper, and spinach - less common vegetables) and asked to identify them, if they had tried and if they liked each vegetable (exposure). Children were also asked to speak freely about what they thought of vegetables (perceptions).

Results

Carrot was the most known vegetable followed by cucumber and broccoli (Figure 1).



Carrots, cucumbers and broccoli were the most tried and liked vegetables while pepper and spinach were least tried and liked. The least known, tried and liked vegetables were spinach and cabbage (Table 1).

Table 1. Vegetable liking and trying, n (%)

	Tried			Liked		
	Yes	No	Total*	Yes	No	Total*
Broccoli	238 (65 %)	126 (35%)	364	227 (87%)	35 (13%)	262
Cabbage	195 (54%)	165 (46%)	360	181 (83%)	36 (17%)	217
Carrot	309 (84%)	57 (16%)	366	302 (90%)	34 (10%)	336
Cucumber	261 (72%)	101 (28%)	362	254 (89%)	33 (11%)	287
Pepper	196 (56%)	157 (44%)	353	174 (77%)	52 (23%)	226
Spinach	184 (52%)	168 (48%)	352	173 (81%)	41 (19%)	214

*n based on intelligible answers from a total of 400 responses.

Females were more likely to correctly identify, try and like vegetables ($p < 0.05$) when compared to males and five year olds were more likely to identify vegetables correctly than 3 or 5 year olds ($p < 0.05$). Perceptions of vegetables were mixed, with 58% positive (e.g. veg are good) and 14% negative (e.g. "I don't like vegetables") while 14% were neutral (e.g. associated with animals or what children saw).

Conclusions

Infants attending nurseries are able to identify, try and like vegetables they are more likely to be exposed to (e.g. carrots vs. peppers) and can develop positive perceptions towards vegetables.

Poster Shift 1: Infancy

AN INVESTIGATION OF WEANING KNOWLEDGE AND SOURCES OF WEANING ADVICE- AN IRISH PERSPECTIVE

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Background and Aims

The timing of infant weaning (milk to solids) is crucial for both nutritional and developmental reason¹. It can also influence infant's future eating behaviours^{2,3}. In Ireland compliance to weaning recommendations is poor³. Moreover healthcare professional's advice to parents is varied⁴. The aim of this study is to investigate Irish first-time mothers knowledge of the weaning guidelines and sources of weaning advice.

Methods

Participants are required to complete an online survey using a previously validated questionnaire¹ adapted for an Irish setting.

Results

This study is still on-going but to date it the study reveals that there is great parental anxiety and confusion in relation to best weaning practices. The internet was considered the most influential source of information due to conflicting information provided by different health care professionals.

Conclusions

It is of concern is that parents are opting to use the internet as a primary source of weaning information. The internet is not policed in terms of what information is posted or who is allowed to post information. Parents may receive incorrect messages in relation to infant nutrition advice. Health professionals who routinely see infants have the opportunity to provide correct advice⁵. This necessitates all involved in caring for children operate from the same guidelines and recommendations to avoid confusion and help reduce anxiety levels in parents.

Poster Shift 1: Infancy

PROGRAM IMPACT ON CHILD GROWTH IN RURAL MALAWI: PRELIMINARY FINDINGS FROM A LONGITUDINAL COHORT STUDY

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Background and Aims

We are evaluating the mid-term impact of an 18-month program providing a daily lipid-based nutrient supplement (LNS) with social and behavior change communication (SBCC) starting at mid-infancy, on undernutrition [weight-for-length (WLZ) and weight-for-age (WAZ) z-score] and linear growth [length-for-age z-score (LAZ)] in rural Malawi.

Methods

Two cohorts of infants, aged 6-7 months, were enrolled in the program (n=171) and comparison (n=176) districts, respectively, and assessed after 6 and 12 months, or at 12 and 18 months of age, respectively. Child weight and length were taken at each visit. Multilevel mixed-effects linear regression models estimated the program impact on growth, accounting for within individual/village correlations, age, sex, and baseline nutritional status.

Results

Percentages of children stunted and wasted were comparable at enrollment in both districts: 42.4% and 1.5% (districts combined), but underweight was higher in the program district (15.4% vs. 6.5%; $p < 0.01$). After 6- and 12-months of program exposure, WAZ increased by 0.20 Z and 0.17 Z, respectively, in program over comparison district ($p < 0.05$). No statistically significant differences between groups were noted for WLZ or LAZ, although a trend toward a higher LAZ may be emerging in the program district at 6 (+0.13 Z) and 12 (+0.14 Z) months ($p < 0.20$). Further, after 12 months, the percent of children stunted, underweight and wasted is lower by 8.8% ($p = 0.12$), 8.4% ($p = 0.04$), and 3.7% ($p = 0.12$), respectively, in the program vs. comparison district.

Conclusions

Provisional findings suggest that a daily LNS and SBCC starting at 6 months of age in rural Malawi reduces undernutrition and may be reducing stunting.

Poster Shift 1: Infancy

POSTNATAL GROWTH IN TERM INFANTS BORN SMALL FOR GESTATIONAL AGE AND LATER HEALTH: SYSTEMATIC REVIEW

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Background and Aims

Low birth weight followed by rapid postnatal growth has been implicated in risks for adiposity and metabolic diseases later in life. While rapid weight gain may be advantageous in certain low birth weight populations, such as preterm infants, the scenario may be different for full-term infants born small for gestational age (SGA).

Methods

This systematic review summarizes published evidence on the potential effects of postnatal weight gain/growth in term infants born SGA on neurodevelopment and metabolic outcomes.

Results

We identified 34 studies. Only two were randomized trials, in which a nutrient and energy enriched infant formula that promoted early growth increased lean mass, but also fat mass and blood pressure, and had no effect on early neurocognitive outcomes. The remaining 32 observational studies reported: i) consistent positive associations for postnatal weight gain/growth with neurocognitive outcomes; ii) positive associations for postnatal weight gain with later adiposity and blood pressure (BP), although SGA individuals remained less adipose and with lower BP than appropriate for gestational age (AGA) individuals; iii) positive association between postnatal weight gain and insulin resistance, and SGA were more insulin resistant than AGA individuals. Observational studies found no consistent window of postnatal weight gain/growth associated with later outcomes.

Conclusions

Postnatal weight gain was associated with higher adiposity and blood pressure among SGA individuals, although they remained below the level of AGA individuals. Potential long-term benefits of early growth in term SGA individuals on neurocognition in observational studies could be due to confounding, but support the rationale for intervention studies.

Poster Shift 1: Infancy

EFFECT OF PROVISION OF A BREAST PUMP ON BREASTFEEDING PRACTICE: A RANDOMISED, MULTI-CENTRE TRIAL IN TERM MOTHERS

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Background and Aims

Provision of a breast pump could facilitate longer breastfeeding duration by enabling the feeding of expressed breast milk (EBM) when breastfeeding is not possible. However, it is also possible that starting milk expression early could interfere with normal establishment of breastfeeding (BF). We tested the effect of provision of an electric pump at 2-4 weeks post-partum in a randomised trial.

Methods

170 exclusively breastfeeding (EBF) mothers with term infants from Beijing (n=45), Moscow (n=51), London (n=68) and New York (n=6) were randomised to receive a single-electric pump/bottle system, A (Philips Avent Comfort+Natural) or B (Medela Swing+Calma) or to be a control (C; no pump; voucher of same value). At 3 and 6 months post-partum, 80% of mothers completed infant feeding questionnaires.

Results

In intention-to-treat analyses EBF at 3 months was 86%, 85% and 84% in group A, B and C (ns) respectively. EBM had been fed by 77% of pump mothers compared to 24% of controls (p<0.001).

At 6 months, EBF rates were 20%, 15% and 20% in group A, B and C respectively (p=ns), whilst 74%, 68% and 80% were EBF or BF with solids or ≤ one formula feed a day (p=ns); results of per protocol analyses did not differ.

Conclusions

Provision of an electric breast pump between 2 and 4 weeks post-partum to mothers who were motivated to breast-feed resulted in greater provision of EBM but did not affect the rate of BF at 3 or 6 months. The effect of this intervention in less motivated mothers warrants investigation.

Poster Shift 1: Infancy

PERCEPTIONS OF SEVERE ACUTE MALNUTRITION AND ITS MANAGEMENT IN INFANTS UNDER SIX MONTHS OF AGE: AN EXPLORATORY QUALITATIVE STUDY IN BANGLADESH

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Background and Aims

Acute malnutrition is a public-health problem among infants aged <6 months (infant<6m). WHO guidelines advise community-based treatment for clinically stable ('uncomplicated') patients; current country-level guidelines only describe inpatient care. We aimed to inform and shape future management strategies by understanding community perceptions on: malnutrition aetiology; barriers and facilitators to outpatient-based care.

Methods

In-depth interviews and focus group discussions in southern Bangladesh, conducted October-December 2015. Thematic analysis of transcripts. Sample size by data saturation.

Results

We conducted: five focus-groups with 29 caregivers; four focus-groups with 29 healthcare workers; four key-informant interviews with community leaders; four key-informant interviews with health supervisors. Five themes emerged:

1. **Identification of affected infants and care-seeking behavior:** malnutrition was not usually spotted till severe. Both allopathic and local/traditional healers were consulted following initial self-care.
2. **Perceived causes of malnutrition:** these included illness, lack of breastfeeding; adverse social circumstances; local misconceptions around feeding
3. **Views and preferences on treatment:** community health-care workers were seen as important; respondents highlighted the need to look after the carer/mother alongside the infant.
4. **Perceived benefits and risks of community-based treatments:** lower cost and greater accessibility were appreciated but respondents worried about quality of care in the community.
5. **Community networks:** family/social support networks were seen as important.

Conclusions

There is potential and demand for community-based care for infants <6m. This requires: better and earlier identification; health-systems strengthening (including to avoid community options being perceived as "second best"); a package of care addressing root causes and early involvement of community support networks.

Poster Shift 1: Infancy

PREVALENCE, RISK FACTORS AND OUTCOMES OF SEVERE ACUTE MALNUTRITION AMONG INFANTS AGED

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Background and Aims

Despite some 4 million infants <6 months old (u6m) having Severe Acute Malnutrition (SAM) worldwide, evidence informing their care is 'very low' quality. To inform future intervention studies, we aimed to document seasonal prevalence and outcomes using current management guidelines.

Methods

Pre and post-harvest anthropometric prevalence surveys in infants u6m in Barisal district, Bangladesh; and a prospective cohort study of two groups of 77 sex-matched 4-8 week-old infants: SAM [weight-for-length Z-score (WLZ) <-3 and/or bipedal oedema], Non-SAM, [WLZ ≥-2 to <2, no oedema, mid-upper-arm circumference (MUAC) ≥125 mm]. Infants were followed-up at age 6 months, re-assessing nutritional and clinical status.

Results

SAM prevalence was 5.9% pre-harvest and 0.8% post-harvest. Infants with SAM were younger than non-SAM controls (5.1±1.2 vs. 6.5±1.2 weeks, p=0.001). Their duration of exclusive breastfeeding was shorter at enrolment (3.9±2.1 vs. 5.7±2.2 weeks, p<0.0001) and at 6 months endline (13.2± 8.9 vs. 17.4±7.9 weeks; p=0.003). Maternal education, satisfaction with breastfeeding and household electricity were also associated with baseline SAM. With minimal treatment, 18(23%) infants in SAM group still had SAM at 6 months vs only 1(1%) non-SAM control. They were also significantly thinner (mean WLZ -1.28±1.3 vs 0.16±1.0, p=0.001) and more stunted (mean HAZ -2.57 ± 1.4 vs. -1.14 ± 0.8, p=0.001). 3(4%) of infants with SAM but none in the control group had died.

Conclusions

Infants u6m SAM is not uncommon and requires improved treatment. Breastfeeding support is likely to be an important but not the sole component of a package of care needed to improve future outcomes.

Poster Shift 1: Infancy

EFFECT OF AFLATOXINS ON INFANT GROWTH

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Background and Aims

Aflatoxins are fungal toxins produced by certain species of *Aspergillus* especially *A. flavus* and *A. parasiticus*. Aflatoxin M₁ is a hydroxylated metabolite of aflatoxin B₁ formed in liver and excreted into breast milk. The aim of this paper was assesment of the relationship Aflatoxins and infant growth.

Methods

Necessary literature review have been done.

Results

The association between aflatoxin exposure and infant stunting is less well-defined. AF-albumin, reflects an integrated measure of exposure over several months. The presence of AFM₁ in mothers' breast milk was associated with lower length at birth and with the presence of AFM₁ in infants. several studies linking aflatoxin to growth impairment in infant. Cross-sectional studies demonstrated that stunting and underweight were associated with higher AF-alb levels.

Conclusions

many world regions where populations are at risk from chronic high level Aflatoxins exposures. Childhood stunting is associated with cognitive impairment and increased vulnerability to infectious disease. According to the findings of this study, we need developing strategies to reduce exposure to aflatoxin in foods and breast milk.

Poster Shift 1: Infancy

FREQUENT TRANS FATTY ACID CONSUMPTION CAUSED ENRICHMENT OF TRIGLYCERIDE AND CARBOHYDRATE WITH LOSS OF CHOLESTEROL AND APOLIPOPROTEINA-I IN BREAST MILK RESULTING IMPAIRMENT OF EMBRYO GRWOTH

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Background and Aims

It is well known that breast milk is the best nutritional source for infant growth. However, there has been no information about the quality of breast milk from individuals who daily consume a trans fatty acid (TFA)-enriched diet.

Methods

We performed compositional and functional analyses with breast milk from lactating mothers, in terms of lipid content and zebrafish embryo survivability, among individuals who daily consumed TFA-enriched food (n = 5), normal diet as control (n = 5), and powder formula (n = 5).

Results

In lipid content of breast milk, the control group showed 2.5- and 4.5-fold higher cholesterol content than the TFA group and infant formula, respectively. The TFA group and infant formula showed 1.8- and 2.0-fold higher triglyceride than the control group. Moreover, the TFA group and formula showed 1.4- and 4.8-fold higher glucose levels compared with control. The TFA group also showed 25% lower protein content than control. Microinjection with breast milk from the TFA group showed significantly lower zebrafish embryo survivability (50±4%) compared with the control (66±5%), whereas microinjection with formula showed the lowest survivability (39±5%) with the slowest developmental speed. Immunodetection revealed that breast milk from the TFA group showed smaller-sized apoA-I (25.5±0.6 kDa) than that from the control group (27.5±1.5 kDa), whereas formula did not contain apoA-I. Larger apoA-I size in breast milk was directly associated with higher embryo survivability.

Conclusions

Breast milk from the TFA group showed increased TG and loss of cholesterol, lactalbumin (14 kDa), and apoA-I proteins, resulting in functional impairment of development and growth.

Poster Shift 1: Infancy

HOW DOES THE FIRST BREASTFEEDING EXPERIENCE EFFECT THE DURATION OF BREASTFEEDING THE SECOND CHILD? THE INFLUENCE OF PSYCHO-SOCIAL FACTORS

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Background and Aims

Background and aim: Breastfeeding rates are only increasing slowly. Especially parity may contribute to explain the breastfeeding duration with its physiological and psycho-social components. The aim was to investigate the influence of the breastfeeding duration of the first child and psycho-social factors on the duration of the following child.

Methods

Method: A 5 year follow-up study design was used with online questionnaires to women the month their first child turned five-years old. In statistical multivariate analysis the duration of full and any breastfeeding the first child and of the second child were respectively addressed as the exposure and outcome variables, in addition to the study variables intention and self-efficacy.

Results

Results: The duration of full and any breastfeeding of the first child were significantly associated with full and any breastfeeding duration of the second child ($p < 0.000$). The full breastfeeding period was longer for the second child, especially for mothers who had fully breastfed for less than 4 months first time. The self-reported intention and self-efficacy in ability to breastfeed the second child after having breastfed the first child demonstrated strong association with the actual full and any breastfeeding duration of the second child. The self-efficacy was the strongest mediating factor for the second breastfeeding duration, and the intention and self-efficacy explained nearly 50 % of the full breastfeeding duration of the second child.

Conclusions

Conclusion: Breastfeeding support should focus on first time mothers and second time mothers with previous short breastfeeding experience as there is a reinforcing effect.

Poster Shift 1: Infancy

INCORPORATION OF DAIRY LIPIDS AND LACTOBACILLUS FERMENTUM IN INFANT FORMULAS: LONG-TERM EFFECTS ON INTESTINAL PERMEABILITY, MUCOSAL IMMUNITY AND METABOLISM IN A MINIPIG MODEL

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Background and Aims

Incorporation of dairy lipids (DL) in infant formula (IF) has been associated with short-term benefits on digestion, gut physiology and microbiota in a piglet model. Clinical studies showed that the probiotic *Lactobacillus fermentum* CECT 5716 (Lf) might prevent infections in infants. The objective of this study was to investigate the long-term synergistic effects of DL and Lf in IF on growth, intestinal barrier function and metabolic and immunologic status of adult Yucatan minipigs.

Methods

Piglets received from postnatal day 2 to 28 a formula containing either: only plant lipids (PL), a half-half mixture of PL and DL (DL), a half-half mixture of PL and DL supplemented with Lf (DL+Lf). Pigs were subsequently fed a standard diet for 1 month and then challenged with a high-fat, high-sucrose diet for 3 months.

Results

Growth, food intake, lipid and glucose metabolism dysfunctions induced by the obesogenic diet were similar whatever the IF received in the postnatal period. However, intestinal permeability, immune responses, and plasma and fecal metabolomic profiles were modified by DL+Lf incorporation. DL+Lf increased ileum transcellular permeability and conductance and decreased LPS passage in jejunum compared to PL. It also modified cytokine secretion of ileal explants compared to PL.

Conclusions

This study highlights a long-term effect of early consumption of DL+Lf on intestinal barrier, immune orientation, and plasma and bacterial metabolomic profiles. Changes in microbiota composition and consequences on the intestinal endocrine function are under investigation.

Poster Shift 1: Infancy

DIFFERENT IRON SOURCES IN INFANT NUTRITION INDUCE CHANGES IN GENE EXPRESSION OF IRON TRANSPORTER AT THE INTESTINAL LEVEL

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Background and Aims

Infant food iron fortification can be considered one of the most sustainable long-term strategies to reduce the prevalence of iron deficiency and ferropenic anemia. The success of iron fortification mainly depends on the mineral form chosen. Electrolytic iron (HE) is being used as the main source for iron fortification. However, it shows low intestinal absorption compare to other chemical forms as ferrous sulphate (SF). As potential alternatives for supplementation, ferrous fumarate (FF) and micronized dispersible ferric pyrophosphate (PF) should be considered.

The aim of this project is to select a high bioavailable iron source which can be used for supplementing infant cereals. The iron absorption mechanism was studied through the analysis of the expression of specific iron transporter-encoding genes.

Methods

The human intestinal cell line, Caco-2, was grown and stimulated with the 4 iron sources. RNA was extracted with the RNeasy kit from Qiagen (following the manufacturer's instructions) and after checking the RNA integrity and performing cDNA synthesis, RT-qPCR was performed using primers specific for 9 iron-related genes, plus 4 reference genes.

Results

DMT-1, one of the most important non-heme iron transporters involved in the iron uptake, increased in expression with PF, while the other 3 treatments decreased it. PF and FF increased the expression of FP-1 and HEPH, genes involved in the iron excretion to the circulatory system. On the contrary, HE and SF decreased the expression of these two proteins.

Conclusions

Ferrous sulphate induced the accumulation of iron in intestinal cells, while ferric pyrophosphate stimulated the iron transport from gut to blood.

Poster Shift 1: Infancy

DIETARY PATTERNS AT 12 MONTHS OF AGE: BASELINE FFQ ANALYSIS OF THE GROWING UP MILK – ‘LITE’ (GUMLI) TRIAL

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Background and Aims

Diet during early childhood is an important, modifiable determinant of health. We aimed to describe the dietary patterns of 160 Australian and New Zealand (NZ) children aged 12 months \pm 2 weeks from the Growing Up Milk – ‘Lite’ Trial.

Methods

Primary caregivers completed a previously validated 99-item interviewer-administered Food Frequency Questionnaire. Principal components analysis was used to extract dietary patterns. Multivariate analyses were used to determine associations of dietary patterns with socio-demographic factors.

Results

Three previously defined dietary patterns were identified. Dietary pattern 1 - ‘infant guidelines pattern’, was associated with being Australian European (0.442, 95% CI -0.096, 0.980), Maori (0.360, 95% CI -0.421, 1.141), or Pacific ethnicity (0.161, 95% CI -1.312, 1.634) and the study child being female (0.399, 95% CI 0.086, 0.712). Dietary pattern 2 - ‘adult foods’ pattern, was associated with primary (0.506, 95% CI -0.978, 1.989) or secondary (0.614, 95% CI -0.061, 1.288) maternal education, household incomes between \$30-50,000 (0.147, 95% CI -0.673, -.967) and \$70-100,000 (0.030, 95% CI -0.691, 0.750) per year. Dietary pattern 3 - high consumption of breast milk (‘breast milk’ pattern) and was associated with breastfeeding at baseline (1.421, 95% CI 1.178, 1.664).

Conclusions

Maternal socio-demographic factors are associated with the eating patterns of children 12 months of age. This analysis forms the basis of a longitudinal study on stability of dietary patterns in the second year of life.

Poster Shift 1: Infancy

INFANT APPETITE AND TEMPERAMENT AS PREDICTORS OF INFANT GROWTH

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Background and Aims

Early life is a sensitive critical window for infant programming that may affect later growth and health outcomes. However, the effects of infant behaviours on early infant growth are poorly understood. Objective: To investigate effects of infant temperament and appetite traits on infant growth.

Methods

Pregnant women, recruited from antenatal clinics in Malaysia, were followed up postnatally during home visits (HV) when the baby was 2-3, 6-8, 12-14 and 16-18 weeks old to assess weight, length and head circumference. During HV, infant appetite was assessed by Baby-Eating-Behaviour-Questionnaire and infant temperament by Rothbart-Infant-Behaviour-Questionnaire-Revised.

Results

Infant appetite (Food-Responsiveness; responsiveness to maternal cues for feeding, and Slowness-In-Eating; the pace of feeding) and temperament (Effortful-Control; ability to self-regulate emotions) traits were associated with infant growth: i) Mean Food-Responsiveness score was positively associated with weight-SD, weight-SD gain and infant BMI-SD (all $p < 0.05$), whereas Slowness-In-Eating was negatively correlated with infant weight-SD ($p < 0.05$); ii) Effortful-Control was positively correlated with BMI-SD and weight-SD gain. The associations remained significant when these behaviour traits were included in multivariate models, in which they were shown to predict infant growth at different time points.

Conclusions

Food-Responsiveness and Effortful-Control were shown to be positive predictors of weight and BMI, whereas Slowness-In-Eating was a negative predictor of weight and BMI during early infancy. Therefore, early determination of these appetite and temperament traits could be helpful in predicting the potential risk of overweight or obesity later in life, especially if the results persist at later ages. Hence, further research with longer follow-up and a larger sample size is needed.

Poster Shift 1: Infancy

CAN IRON FORTIFICATION AFFECTS GUT MICROBIOTA? THE USE OF WEANED PIGLETS AS A MODEL

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Background and Aims

Iron deficiency anemia can be reduced by fortifying foods with iron salts. Depending on the source of iron and its bioavailability the intestinal microbiota has been reported to be adversely affected. The objective of this study was to analyze the changes in gut microbiota after fortification of the diet with Encapsulated and Micronized Ferric Pyrophosphate: EMFP; Ferrous Fumarate: FF; or Electrolytic Iron: EI, compared with the standard salt Ferrous Sulfate Heptahydrate: SFH. Anemic piglets were used as an animal model.

Methods

30 weaned anemic piglets were fed with an iron deficient diet for 7 days. In the repletion period the subjects (n=6) received identical diets except for the Fe source (120mg/kg Fe). The assay consisted in four groups with different iron salts and one with no iron added (Control -). A Control + group of non-anemic piglets (n=6) was also conducted. Bacterial groups in stools were studied by qPCR (*Bifidobacterium spp*, *Lactobacillus spp*, *Bacteroides spp*, *Atopobium spp*, *Clostridium leptum*, *Clostridium coccooides*, *Enterobacter spp.*, *Enterococcus spp.*, and total bacteria).

Results

The results show that intestinal microbiota increases during the growth of the piglets in all groups. Statistically significant differences were found between EI and FF for *Bacteroides*, *Atopobium spp*, *Clostridium coccooides*, *Lactobacillus spp* and total bacteria (P<0.05).

Conclusions

EMFP did not increase most bacterial populations. This fact may be due to its high bioavailability which would result in a high iron absorption in the small intestine and less iron access to the large intestine to be used by the groups of bacteria studied.

Poster Shift 1: Infancy

INFANT FEEDING PRACTICES IN TAMIL NADU, INDIA: COMPARISON WITH WHO INDICATORS

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Background and Aims

The WHO criteria for assessing infant and young child feeding (IYCF) practices allow assessment of feeding practices and facilitate comparisons, but several complications arise in the classification of IYCF practices that may confound subsequent analyses. Infant feeding milestones are rarely discrete events and fluctuations in the introduction and/or use of water, non-human milk, and complementary food make categorizing feeding practices more difficult. The aim of this study is to explore those issues in the context of a study completed in south India.

Methods

Data were collected from 132 women around Chennai, India: maternal work status, IYCF practices (using 24-hour recalls and food frequency questionnaires; categorized using WHO indicators), and infant length and weight collected when the infants were <5 months of age and again ~6 months later.

Results

All mothers initiated breastfeeding. Determining duration (3.6 ± 2.1 months) of exclusive breastfeeding (EBF) proved challenging as several participants periodically gave water or non-human milk, and 44 participants gave herbal infusions before 5 months of age. Age at introduction of complementary foods was 5.0 ± 1.0 months.

Conclusions

Most participants were not meeting the WHO recommendations for EBF and complementary feeding. However, difficulties arose when trying to classify some feeding practices that did not follow a clear sequential pattern. Issues with classifying feeding practices that can be fluctuating may mask other trends in infant growth. Additionally, this may lead to issues when making comparisons between studies that do not use the same specific criteria. Greater specificity in classification criteria would be helpful.

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Poster Shift 1: Infancy

USING THE HYDROLYZED PROTEIN INDUSTRIAL FORMULA IN INFANTS TREATED WITH THE HOME ENTERAL NUTRITION (HEN) - NOT ONLY IN CASE OF ALLERGY

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Background and Aims

The most common indications for chronic enteral nutrition during infancy are prematurity, neurological problems and genetic birth defects. All of these medical conditions may be related with gastrological disorders, malabsorbtion and maldigestion. As a result the symptoms of diet intolerance and the insufficient weight/growth gain are often observed. Based on our practice the replacement of polymeric diet by the hydrolyzed protein industrial formula (Infatrini Peptisorb) may be benefit in such group of patients.

Methods

We retrospectively analyzed the data of 44 infants qualified to the HEN since 01.01.2014- till 18.12.2015. The indications for enteral nutrition and additionally among the patients fed with Infatrini Peptisorb the reasons for using such diet and the nutritional status at baseline and 3 months after the start of therapy were analyzed.

Results

The hydrolyzed protein industrial diet was introduced mainly in patients with genetic congenital malformations (40%), prematurely infants (25%) and children with neurological problems (23%). In 17 cases (89%) the decision was taken due to the observation of polymeric diet intolerance, demonstrated by vomiting after the increase of diet's volume (n=10), loose stools (n=7), flatulence (n=7) and anxiety during feeding (n=9). In all 17 children the replacement of polymeric industrial diet by the Infatrini Peptisorb was effective and leads to the reduction of the intolerance's symptoms.

Conclusions

Among infants who needs chronic enteral nutrition the using of hydrolyzed protein industrial diet can be benefit in other than cow's milk allergy cases. The special attention should be paid to children with genetic congenital malformations, neurologic problems and prematurely infants.

Poster Shift 2: Infancy

DEVELOPMENT AND EVALUATION OF A HAND-BROCHURE ON COMPLEMENTARY FEEDING FOR MOTHERS OF INFANTS IN SRI LANKA

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Background and Aims

Prevalence of underweight among children aged 6-59 months was 23.5% in Sri Lanka. The aims of this study were to develop a hand-brochure on complementary feeding and evaluate its effectiveness as nutrition intervention tool.

Methods

A hand-brochure was selected for this study as it is easy to develop, inexpensive, freely distributed and can include more information. The hand-brochure was developed incorporating information gathered by referring complementary feeding information and discussing with health-care professionals deal with infancy. The evaluation was done as a quasi-experimental study using fifty-seven mothers of infants' at complementary feeding. Pre-intervention, knowledge of complementary-feeding was assessed using a pre-tested questionnaire. A post-intervention knowledge was done four weeks after distributing the hand-brochure using the same questionnaire. The subjects who scored between 20-14, 10-13 and 0-9 for the knowledge assessing questionnaire were categorized as to have "good", "moderate", and "weak" knowledge levels respectively. Mean scores of pre and post-intervention knowledge of complementary-feeding were compared using dependent sample t-tests.

Results

The hand brochure was developed in A4 size (21cm*29.7cm) with three folds (6 sides). Pictorial format and simple language were used. The percentage mothers of infants having "good" knowledge level were increased from 16% to 37% during pre and post-intervention. The increment of the mean knowledge score of mothers of infants before and after intervention was ranged from 9.96(3.4) to 12.28(3.5), showed a significant improvement of knowledge ($P < 0.05$).

Conclusions

The newly developed hand-brochure can be used as effective nutrition intervention tool for improving correct complementary feeding practices in Sri Lanka.

Poster Shift 2: Infancy

FEEDING PRACTICES OF MOTHERS' OF INFANTS IN A RURAL AREA IN SRI LANKA

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Background and Aims

This study was conducted to identify the infant feeding practices in a rural area in Sri Lanka.

Methods

Mothers of infant who were attending Maternal and Child Health (MCH) clinics were recruited. Permission was obtained from the Health Authorities, Pannala, in Kurunegala District in Sri Lanka. Informed consent was obtained by briefing the study to mothers. Mothers were interviewed using a pre- tested interviewer administrated questionnaire.

Results

One hundred mothers' age ranged from 20 to 42 years with a mean age of 28.6 (SD 4.6) years. Out of the total, there were no any illiterate. Results revealed that all mothers knew about Exclusive Breast Feeding (EBF) period as up to 6 months but only 73% of them practiced EBF. A majority (97%) thought that colostrum is good for the baby and 96% fed colostrum. Only 22% of mothers have given other feeds during EBF. Eighty percent knew and practiced the initiation time of complementary foods as after 6 months. Sixty seven percent and 27% of mothers introduced mashed food and semi-solid foods as initial complementary feeding respectively. Ninety percent said that family foods should be introduced after 1 year and 87% told sugar and salt should be introduced after 1 year. However, 76 % introduced sugar and salt before one year. Ninety three percent of mothers did not keep left over foods for next feeding and 92% have changed the way of feeding during mothers' and child's illness.

Conclusions

This study concludes the mothers had appropriate practices regarding infant feeding in selected area.

Poster Shift 2: Infancy

GROWTH FAILURE IN INFANTS WITH COMPLEX CHD OVER THE FIRST YEAR OF LIFE

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Background and Aims

Background and Aims: Growth failure is a well-recognized, common occurrence in infants with congenital heart disease (CHD). Despite surgical intervention in the neonatal period, more than 50% of these infants exhibit inadequate growth with greater than 30% falling below the third percentile in weight-for-age early in life. The aim of this study was to evaluate the presence of growth failure as defined by a weight for age z-score of <-2 over the first year of life in infants with complex congenital heart disease who underwent neonatal palliative or corrective surgery.

Methods

Methods: In this prospective longitudinal study infants were evaluated for growth at 3, 6, 9, and 12 months in the Nutrition and Growth Laboratory. Each weight was completed 3 times and an average was recorded. Infants were categorized by post-operative physiology- single ventricle (palliative surgery) (N=34) vs 2 ventricle (corrective surgery) (N=38). All infants underwent surgery during the first two weeks of life.

Results

Proportion of Infants with a weight for age z-score ≤ -2

Month	Overall	SV	BV	p-values ^[a]
Discharge	30%	28%	31%	0.99
Month 3	27%	33%	22%	0.40
Month 6	16%	28%	9%	0.11
Month 9	9%	11%	7%	0.99
Month 12	3%	6%	0%	0.22

Conclusions

Conclusion. While it is well documented that infants with SV physiology are at risk for growth failure well into the first year of life, this is the first study to demonstrate that infants who undergo corrective neonatal cardiac surgery are at risk for growth failure post-discharge.

Funding: NIH/NINR R01 NR002093; MO1-RR00240; UL1-RR-024134

Poster Shift 2: Infancy

EFFECT OF SYNBIOTIC CONTAINING LACTOBACILLUS RHAMNOSUS GG AND FRUCTO-OLIGOSACCHARIDES ON THE LEVEL OF FECAL CALPROTECTIN IN INFANTS AT HIGH RISK OF ATOPY

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Background and Aims

Clinical efficacy of pro- and prebiotics for allergy prevention is associated with effect on the mechanisms of immune tolerance as well as on gut inflammation and intestinal wall permeability. Therefore, the level of fecal calprotectin (FC) may be one of the objective criteria of the effectiveness of pro- and prebiotic containing drugs. The aim of the study was to assess the effect of synbiotic containing *Lactobacillus rhamnosus* GG and fructo-oligosaccharides on the level of FC in healthy term infants at high risk of atopy.

Methods

60 healthy newborns (≤ 4 weeks old) with family history of atopy were enrolled in a prospective, randomized, controlled clinical trial. All infants were assigned randomly to one of two groups: synbiotic group (exclusive breastfeeding and supplementation of mixture containing *Lactobacillus rhamnosus* GG (4×10^9 colony-forming units (CFU) per day) and fructo-oligosaccharides from 3 to 6 months) and control group (exclusive breastfeeding and no probiotics). Stool samples were collected at 3 and 6 months, and the FC concentration was determined using a commercially available enzyme-linked immunosorbent assay.

Results

At 3 months the majority of infants showed an increased level of FC (mean 277 ± 94 mg/g). At 6 months the level of FC reduced in both groups, but its concentration in infants received synbiotic was significantly lower than in controls ($42,6 \pm 12,4$ mg/g vs. $99 \pm 19,4$ mg/g, $p < 0.05$).

Conclusions

Supplementation of synbiotic containing LGG with fructo-oligosaccharides leads to rapid decrease of FC level. This may reflect the positive role of synbiotic in the formation of intestinal microbiota in infants.

Poster Shift 2: Infancy

NUTRITION EDUCATION TO IMPROVE GROWTH AND COGNITIVE DEVELOPMENT AMONG IMPOVERISHED INFANTS: A CLUSTER-RANDOMIZED TRIAL IN UGANDA

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Background and Aims

Malnutrition leading to child growth restriction impairs cognitive- and motor function. We assessed the effect of nutrition- and hygiene education on infant growth and cognitive-/motor development, delivered to mothers in South-Western Uganda.

Methods

In a community-based, open cluster-randomized trial, mother-infant (6-8 months) pairs were enrolled. The intervention (education on: infant feeding, cookery, sanitation, oral hygiene and child stimulation) was delivered in 3 sessions during 6 months. The primary outcome was change in linear growth z-score (LAZ) at 20-24 months. Other anthropometric measures, Bayley Scales of Infant and Toddler Development-III (BSID-III) scores, and Ages and Stages Questionnaire (ASQ) scores were also collected.

Results

We enrolled 511 mother-infant pairs. Mixed linear regression models showed no difference in mean LAZ or other growth measures at 20-24 months between the two groups (Table 1).

Table 1: Mean differences (95% CI) in child growth

	Change	p-value
LAZ	0.10 (-0.09 to 0.31)	0.11
WAZ	0.01 (-0.19 to 0.22)	0.61
HCZ	0.09 (-0.13 to 0.25)	0.61

WAZ-weight-for-age z-score; HCZ-head-circumference z-score.

Notably, the intervention group had higher cognitive-, language- and motor composite scores than the controls on BSID-III (Table 2). Data (not shown) from ASQ supported these findings.

Table 2: Mean differences (95% CI) BSID-III scores

	Change	p-value
Cognitive	15.6 (12.4 to 18.8)	0.0001
Language	8.1 (6.2 to 1.1)	0.0001
Motor	14.6 (12.1 to 17.2)	0.0001

Conclusions

Whereas the intervention did not improve growth, cognitive- and motor development improved markedly.

Poster Shift 2: Infancy

RISK FACTORS FOR SEVERE ACUTE MALNUTRITION IN RURAL GAMBIAN INFANTS

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Background and Aims

Severe acute malnutrition (SAM) affects 16 million under 5's and carries an immediate risk of death. Prevalence remains unacceptably high in sub-Saharan Africa and infancy is a high-risk period. This study aimed to explore the risk factors for SAM in rural Gambian infants.

Methods

A retrospective case-control study from November 2014 to June 2015, in rural Gambia. Cases had weight-for-height z-scores (WHZ) <-3 on at least 2 occasions in infancy. Matched age/gender/village size and distance from the clinic controls had WHZ >-2. Quantitative questionnaires were used to assess the socioeconomic status, water sanitation and hygiene and the mental health of mothers. Qualitative in depth interviews were also conducted with 16 mothers and 4 fathers. Conditional logistic regression was used to determine the risk factors for SAM. A thematic framework was used to analyse the in-depth interviews.

Results

Three hundred and four (83 cases and 221 controls) children were recruited. Increasing frequency of complementary feeds (4 versus 3) [1.44 (1.02-2.04), p=0.04] and illness episodes in infancy [OR 2.81 (1.27-6.18), p=0.01] were significantly associated with SAM in infancy. Maternal perinatal stressors, inadequate support networks, food insecurity, poverty and infant feeding difficulties were associated with SAM in infancy. Protective factors included access to infant feeding/rearing advice from health care workers and support from husbands.

Conclusions

In rural Gambia, mothers who experienced adverse psychosocial events were unable to practise infant feeding and rearing recommendations. Interventions that address maternal mental health, gender empowerment and encourage the involvement of husbands in infant rearing would help to mitigate SAM.

Poster Shift 2: Infancy

POSSIBLE MALNUTRITIONAL EFFECT BY THE TIME OF STARTING COMPLEMENTARY FOODS AMONG CHILDREN AGED 0–5 YEARS IN BATOURI, CAMEROON

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Background and Aims

Malnutrition continues to contribute to a high under five mortality rate. The present study aimed to clarify the prevalence of malnutrition and association with the time of starting complementary foods among children aged 0–5 years in Batouri, Cameroon.

Methods

Mothers (n = 212) were interviewed using a structured questionnaire. Height (H), length (L), and weight (W) measurements of the child were determined along with Z-scores (Z) of WHO child growth standards.

Results

The prevalence of stunting (H/LAZ < -2 standard deviations [SD]) and underweight (WAZ < -2SD) were 45.8% and 30.2%, respectively. Multiple regression analysis was performed using the values of all indicators as the dependent variable and the time of starting complementary foods, child's age, and sex as independent variables. Even after considering sex and age, there was a significant association between the time of starting complementary foods and H/LAZ and WAZ values. Next, another multiple regression analysis was performed using the values of all indicators as the dependent variable and the ethnic group, mother's educational level, occupation of husband and residence as independent variables in children aged 2–5 years. Even after considering sociodemographic variables, there was a significant association between the time of starting complementary foods and WAZ values.

Conclusions

These results suggest that children's nutritional status is associated with time of starting complementary foods.

Poster Shift 2: Infancy

COMPARING THE NUTRITIONAL STATUS OF ORPHANS AND NON-ORPHANS CHILDREN UNDER-FIVE YEARS IN SUNYANI MUNICIPAL IN THE BRONG AHAFO REGION, GHANA

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Background and Aims

Orphan children are regarded as the less privileged in the society. A lot of factors contribute to the nutritional status and well-being of orphans living in orphanages worldwide. The study was conducted to compare the nutritional status of orphan and non-orphan children aged 0-59 months.

Methods

A total of two hundred and forty-six under five children (123 orphans and 123 non-orphans) and their caregivers participated in the study. A structured, administered questionnaire consisting of childcare practices, socio-demographic characteristics, dietary intake, clinical assessment and anthropometric measurement was used to gather data.

Results

The rate of malnutrition in the non-orphans was 58.1% (under-nutrition 42.3%, over-nutrition 15.8%). The rates of wasting, stunting and underweight were 9.6%, 28.9 and 6.5% respectively. Meanwhile the rate of malnutrition in the orphans was 73.5 (under-nutrition 62.1%, over-nutrition 11.4%). The rate of wasting, stunting and underweight in the orphans were 18.4%, 30.7%, and 13.1% respectively. Prevalence of chronic malnutrition was generally higher in orphan children than non-orphan children (73.5% vrs 58.1%) and prevalence of under nutrition was significantly higher among orphans as compared to non-orphans (62.1% vrs 42.03%) ($p < 0.001$). The rates of stunting and wasting were significantly lower among the orphan group ($P < 0.001$). Again, 65.1% of the non-orphans and 92.7% of orphans met the minimum dietary diversity in a day. A significant higher proportion of orphans met the minimum acceptable diet (that is, meeting both minimum meal frequency and minimum dietary diversity score) ($\chi^2 = 177.1$, $p < 0.001$).

Conclusions

Chronic malnutrition was significantly higher among the orphans compared to non-orphans.

Poster Shift 2: Infancy

CASE REPORT: IATROGENIC FAILURE TO THRIVE IN AN INFANT

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Background and Aims

Topic corticosteroids are often used in Pediatrics. The risk of Cushing's syndrome is increased in infants with prolonged use, potent derivatives, and if application occurs on large surfaces.

We call attention for glicocorticosteroids misuse.

Methods

It is reported a case of an infant with iatrogenic Cushing Syndrome due to overuse of topical steroids.

Results

CVQC, 6-month-old boy was admitted to the pediatric endocrinology clinic with the complaint of failure to thrive.

He presented with diaper dermatitis at 7 days of age, when it was prescribed topical Betamethasone, a high-potency corticosteroid. The skin healed in 4 days, but since then the child received uninterrupted treatment with the Betamethasone cream in the perineum 4-6 times per day.

His weight was 4,45kg (-4,94 Z-Score), his length was 53cm (-7,11 Z-Score), and his head circumference was 40cm (-2.96 Z-Score).

He had a Cushingoid appearance with moon face and mild hypertrichosis on his forehead. Blood pressure was 120/60 mmHg. Basal serum cortisol and ACTH levels were low. The peak cortisol response to ACTH stimulation test was insufficient. The Betamethasone cream was immediately stopped. Oral hydrocortisone in physiological dose was used for 6 months. At 3,5 years his height was 97cm (-0,71 Z-Score) and weight 14,2kg (-0,52 Z-Score).

Conclusions

Misuse of topical steroids in infants may lead to Cushing's syndrome. Patients who are given topical steroid treatment should be offered information about the dosage, duration, and possible systemic side effects of the therapy. Such medications should be prescribed in small amounts and their use limited to a short period.

Poster Shift 2: Infancy

NUTRITIONAL FACTORS ASSOCIATED WITH ROTAVIRUS ENTERITIS IN OLTENIA COUNTY

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Background and Aims

Rotavirus enteritis (RE) is a common disease in Romanian children, as the vaccine is not yet included in the national program.

The aim of our study was to identify the relationship between nutritional factors and disease evolution in children.

Methods

We conducted a retrospective study of the children diagnosed with RE admitted in a pediatric infectious disease department between January and December 2016. We performed a stratified analysis regarding the evolution of RE admissions versus various nutritional aspects.

Results

The average and SD breastfeeding time for the severe cases (more than 3 day of intravenous therapy) were 4.89 ± 0.91 months, compared to 6.92 ± 5.28 for the mild cases: $p = 0.001$ (T test). The duration of admission under 4 days was associated with 7.95 months of average breastfeeding, compared to 6.38 months in cases admitted more than 4 days ($p = 0.10$). The vitamin D prophylaxis over 12 months was associated with a shorter admission $p = 0.01$, but not with improved severity: $p = 0.12$. The birth growth or nutrition status at admission had no statistical significant influence on the evolution of the RE disease.

Conclusions

The duration of breastfeeding and the administration of vitamin D seemed to have a protective effect for the children admitted with rotavirus enteritis.

Poster Shift 2: Infancy

PARTICIPATORY WOMEN'S GROUPS AND COUNSELING THROUGH HOME VISITS TO IMPROVE CHILD GROWTH IN RURAL EASTERN INDIA: RESULTS OF A CLUSTER RANDOMISED CONTROLLED TRIAL

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Background and Aims

Around one third of the world's stunted children live in India. We know which nutrition-specific and sensitive interventions improve children's growth, but we lack operational research on how best to increase their coverage in underserved areas. Our study aimed to assess the effect of a community intervention with a new, government-proposed community-based worker on the growth of children under two in rural eastern India.

Methods

We did a cluster randomised controlled trial in two rural districts of Jharkhand and Odisha (eastern India). 120 clusters covering a total population of 121,531 were randomised to the intervention arm or control arm. The intervention involved one community-based worker per c.1000 population. She did a home visit to all pregnant women during the third trimester, monthly home visits to mothers of children aged 0-24 months to support appropriate feeding, infection control, care-giving and referrals, and a monthly women's group meeting using participatory learning and action to catalyse action for maternal and child health and nutrition. Study participants were pregnant women identified in the third trimester and their liveborn children (n=3001). We sought to trace mothers and their children within 72 hours of delivery, and at 3, 6, 9, 12 and 18 months after birth. The trial's primary outcome was children's mean length-for-age Z scores at 18 months. Secondary outcomes included mothers' and children's anthropometry, feeding, infection control, and care-giving practices.

Results

The trial data are being analyzed. We will present results for the primary outcome and all secondary outcomes.

Poster Shift 2: Infancy

MOTHER AND INFANT STUDY COHORT (MISC) IN THE UNITED ARAB EMIRATES (UAE):CHALLENGES AND LESSONS LEARNED

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Background and Aims

In UAE, trend analysis revealed an alarmingly high prevalence of Non-Communicable Diseases (NCDs). Emerging evidence has highlighted the role of maternal and early child nutrition in affecting optimal growth and preventing NCDs later in life.

The aim of this project is to launch the first mother and child cohort in the UAE, exploring maternal diet and lifestyle as well as breastfeeding and complementary feeding practices and their association with early life determinants of NCDs.

Methods

It is an ongoing prospective two-year longitudinal cohort study that recruited pregnant women during their third trimester who attended the prenatal clinics in the hospitals.

Results

263 pregnant mothers were interviewed, and are being followed up, after being consented, (upon delivery and at 2, 6, 12, and 24 months postpartum). Data collection included maternal socio-demographic, lifestyle, dietary intake, and anthropometry. Blood and breast milk samples from the mother upon delivery as well as blood samples from mother and child at 6 months will also be collected. The samples will be analysed for adiponectin, IL6, TNF, insulin, CRP, lipid profile and glucose content. The main challenges that this cohort study presents are retention as well as logistical/cultural complexity, underestimation the necessary start-up time, staff, and costs.

Conclusions

Despite numerous logistical challenges, satisfactory follow-up rates were recorded in the MISC cohort. This Cohort study will shed light on the association of maternal and infants feeding practices with predictors of the NCDs. Strategies addressing challenges are documented, that will assist future researchers planning similar studies in UAE or other Arab countries.

Poster Shift 2: Infancy

BREAST IS (ALWAYS !) BEST...

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Background and Aims

Type 1 tyrosinemia is a rare metabolic disease imposing a specific diet low in phenylalanine and tyrosine , a diet difficultly compatible to breastfeeding...

Methods

A boy of 17 days is diagnosed with tyrosinemia type 1.

NTBC treatment (Nitisinone) is immediately prescribed, and a suitable diet plan is required, specially low in two aminoacids: tyrosine and phenylalanine.

The strict breastfeeding desired by parents is encouraged with caution on the protein intake to control

Results

The initial rate of tyrosinemia was at 75 mg / dL , increased to 100 and 135 mg / dL, quite compatible with international reommandations (200-400 mg / dL); and subsequently decreased to less than 150 mg / dL during 11 months ...

The mother is also subject to dietary protein restriction (minimum meat intake recommendations, low-protein milk)

The child also presents a perfect height-and-weight growth, as well as a good neurological development.

Conclusions

Breastfeeding is difficult but feasible during rare and hard to manage metabolic diseases such as tyrosinemia.

Breast is, definetely, best !

Poster Shift 2: Infancy

THE EFFECT OF MASSAGE WITH COCONUT OIL ON WEIGHT GAIN IN PRETERM NEWBORNS

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Introduction

Growth status and growth velocity are important markers of the health and wellbeing of the preterm newborns. Nowadays, topical oil application is suggested to have a positive effect on growth. Coconut oil is composed entirely of Medium-Chain Acids (MCFAs) which provides a source of highly efficient cellular food. This study was designed to evaluate the effect of massage with coconut oil on weight gain in preterm newborns.

Methods

In this randomized controlled trial 73 study newborns were randomly assigned to three groups: In group A: Massage with coconut oil was given by a trained person, under controlled conditions of temperature during 5 minutes, 4 times a day for 7 days. In group B: newborns received only massage during 5 minutes, 4 times a day for 7 days and in group C: there was no intervention. Weight of newborns was measured daily during study time in three groups. Data were analyzed with spss 14 software. Analysis Of Variance, Kruskal-wallis and Paired t-test were performed to evaluate the effect of massage with coconut oil on weight gain.

Results

There was a significant difference between three groups in weight of newborns after intervention ($p=0.001$). The results of Tukey test indicated that: difference between groups A and B ($p=0.002$), A and C ($p=0.005$) is significant but there was not a significant difference between groups B and C ($p=NS$).

Conclusions

Massage with coconut oil has a desirable effect on weight gain in preterm newborn.

Poster Shift 2: Infancy

HOW ANTIBIOTIC EXPOSURE MODULATES IN VITRO INTESTINAL MICROBIOTA COMPOSITION

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Background and Aims

The effect of antibiotic exposure on microbiota is getting more and more attention, especially early in life where effects during critical windows of development may have long-lasting effects. Little is known however on the effect of specific antibiotics on intestinal microbiota composition.

Methods

We have developed the i-screen platform which mimics the intestinal microbiota composition in a multiwell in vitro system and which allows for studying effects of all kind of variables on the intestinal microbiome. The effect of different food ingredients, probiotics, prebiotics and antibiotics, in combination, and/or at various concentrations on the microbiota composition can be determined. This analysis consists of next generation 16S rDNA sequencing for microbiota composition.

Results

Effects of different classes of antibiotics and different doses of these antibiotics on early life microbiota composition (3-6 months) have been determined. It is clearly shown that different antibiotics have clearly different effects on microbiota composition. It is also clearly shown that these effects can differ from what is known from MIC testing on pure cultures of specific bacteria. Results are presented both from an ecological perspective (overall changes in microbiota composition) both also at a much more detailed level (differences between individual species belonging to the same genus).

Conclusions

New insights in the effect of early life antibiotic exposure on intestinal microbiota composition and potential new treatment strategies can be derived from this novel approach.

Poster Shift 2: Infancy

ACCELERATED LINEAR GROWTH IS OBSERVED IN ETHNIC MINORITY INFANTS IN NORWAY, AND IS PRECEDED BY FETAL “CATCH-DOWN GROWTH “

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Background and Aims

Accelerated infant linear growth, compared with ethnic Europeans, has been observed in some ethnic minority groups. However, few have examined this in relation to the fetal growth pattern. Hence, our aim was to explore ethnic differences in linear growth from mid-pregnancy until 12 months of age.

Methods

The sample was drawn from a population-based cohort in Oslo, Norway. Fetal femur length (FL, proxy measure of linear growth) was measured by ultrasound in gestational week 24, 32 and 37, and crown-heel length (CHL) at birth, 6 weeks, 3, 6 and 12 months postpartum, and converted to gender- and age-specific z-scores. We assessed differences in growth and size, in two ethnic minority groups (South Asians (n=175) and Middle East/N-Africans (n=144), compared with Europeans (n=332).

Results

At gestational week 24, fetuses in both ethnic minority groups were longer than Europeans (mean difference in FL z-score (95% CI): +0.27 SD (0.10, 0.45) and +0.36 SD (0.16, 0.55)). Hereafter they grew slower, and were shorter than ethnic Europeans at birth (mean difference in CHL z-score: -0.25 SD (-0.46, -0.04) and -0.19 SD (-0.42, 0.04)). However, from birth until 12 months, an accelerated growth was observed, and at 12 months Middle East/N-African infants were longer than Europeans (+0.24 SD (0.03, 0.45)).

Conclusions

Accelerated postnatal linear growth was observed in both ethnic minority groups, and was preceded by fetal growth deceleration. Both in mid pregnancy and at 12 months, ethnic minority children were longer than Europeans. Factors contributing to this variation should be further assessed.

Poster Shift 2: Infancy

A MULTIPRONGED RANDOMISED CONTROLLED TRIAL INVOLVING MOTIVATIONAL INTERVIEWING, ANTICIPATORY GUIDANCE AND ORAL HEALTH CARE FOR ABORIGINAL FAMILIES AND CHILDREN TO AGE 2 YEARS

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Background and Aims

We examined whether a culturally-safe intervention developed with Aboriginal communities to reduce early childhood caries improved children's diets.

Methods

The intervention included motivational interviewing, anticipatory guidance, oral health care and fluoride varnish from Aboriginal Health Workers and dentists, during pregnancy and at 6, 12, 18 months of age. The control group received standard care. Diet data was collected by up to three 24-hour multi-pass recalls at 24-months. Weights, heights and arm circumferences were also collected from children. The primary outcome was %energy intake from sugar in discretionary food. Secondary analyses included intakes of macronutrients, number of serves from major food groups and anthropometric z-scores. Analyses were adjusted for randomisation strata, day of recall and interviewer, as well as clustering within individuals' multiple recalls and missing data.

Trial registration #ANZCTR12611000111976.

Results

During enrolment (2011-2012), over 60% of all women pregnant with an Aboriginal baby were enrolled in the trial (n=223 intervention; n=225 control). Follow up at 2-years was 65% and did not differ between the groups. Intervention group children had 1.6% lower energy intake from sugars in discretionary foods (95% CI -0.2, 3.4) than controls. Between-group differences in major macronutrients, or major food group intakes and anthropometry was negligible, although consumption of discretionary foods intakes were lower in the intervention group (mean difference -9 g (95%CI -2, -16)).

Conclusions

A culturally-safe intervention from birth to 18 months had negligible effects on children's diets at 2 years.

Poster Shift 2: Infancy

DEVELOPMENT OF AMYLASE RICH WEANING MIX AND EVALUATION OF ITS NUTRITIONAL, FUNCTIONAL, ORGANOLEPTIC AND STORAGE QUALITIES

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Background and Aims

The present study was conducted to develop amylase rich weaning mix (ARWM) from easily available daily food with minimum technology at home.

Methods

ARWM was developed using combination of germinated wheat and green gram flour, rice flour, almond powder, milk powder, sugar and processed and dried apple. Developed ARWM was evaluated for nutrients including protein, fat, fibre, carbohydrates, calcium, phosphorous, zinc, iron vitamin A and C, functional properties including bulk density, swelling index, water absorption capacity, viscosity and wettability, storage qualities including TVC, yeast and mould count and organoleptic qualities. The developed weaning mix was stored in an air tight container for one month at room temperature.

Results

Nutrients analysis revealed that the developed weaning mix had 15.16 g protein, 6.22 g fat, 73.24 g carbohydrates, 1 g fiber and 409.58 Kcal, 0.35 mg zinc, 92.2 mg calcium, 2.49 mg iron, 68.5 µg beta carotene and 7.39 mg vitamin C per 100 g weaning mix. The developed ARWM was better in terms of providing protein, energy, fat and iron as compare to leading brands of weaning foods in India. Microbial load of weaning mix was within the range of standard given by Food Safety and Standard Authority of India for baby food and no significant change was observed during storage up to one month. Sensory evaluation indicated that the developed mix was highly acceptable.

Conclusions

An attempt should be made to create awareness about production of weaning mixes with minimum processing and technology at home.

Poster Shift 2: Infancy

EFFECTS OF SOY-BASED INFANT FORMULA FEEDING ON ESTROGEN-RESPONSIVE TISSUE AND HORMONE CONCENTRATIONS IN INFANTS

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Background and Aims

Environmental compounds with estrogen-like activity are a focus of environmental regulation and clinical and public health research. Soybeans contain estrogenic isoflavones. Infants exclusively fed soy-based formula are highly exposed to these exogenous estrogens, but their physiologic responses remain uncharacterized.

Methods

Infants fed breast milk (BF), cow-milk formula (CF), or soy-protein formula (SF) from birth to 28 (boys) or 36 (girls) weeks were followed. Estrogenization of urogenital epithelial cells (Maturation Index [MI]) from vaginal and urethral tissue and measured uterine volume (cm³) and breast bud diameter (cm) were assessed using ultrasound. MI and organ-growth trajectories were estimated by feeding group using mixed-effects regression splines.

Results

In the 70 BF, 111 CF and 102 SF infants, maternal characteristics differed primarily between BF and formula-fed (CF or SF) infants. The MI trajectory of SF girls diverged upward from those of both CF (p=0.02) and BF (p=0.01) girls; Uterine volume decreased rapidly in early weeks, though more slowly in SF girls than CF (p<0.01) or BF (p=0.01) girls. Breast-bud growth trajectories for girls did not differ among feeding groups, whereas breast-bud diameter decreased more rapidly with age in BF boys than in CF (p=0.05) or SF (p<0.01) boys.

Conclusions

SF feeding was associated with slowed uterine involution and with greater MI trajectories in both infant girls and boys. These findings are consistent with a tissue-level response to exogenous estrogen in infants.

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Poster Shift 2: Infancy

INFANTILE BERIBERI IN LUANG PRABANG, LAO PDR

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Background and Aims

Beriberi is the clinical condition caused by thiamine deficiency, a significant cause of infant mortality and morbidity in Lao PDR. There is a complex relationship between infantile beriberi and maternal postnatal dietary restriction, or “taboo diet.” The study aimed to review the clinical course of infants under ≤ 1 year of age presenting to the Lao Friend’s Hospital for Children (LFHC) in Luang Prabang, Lao PDR with a diagnosis of beriberi/thiamine deficiency.

Methods

A retrospective analysis of electronic medical records over 10 months (from August 2015 to May 2016) from LFHC was conducted. Cases were defined as ‘possible’ and ‘probable’ beriberi according to defined clinical criteria.

Results

- 1,006 infants aged ≤ 1 year old presented to LFHC Emergency Department between August 2015 and May 2016.
- Of these, 129 infants were diagnosed with beriberi/thiamine deficiency; 48 of these infants fit clinical criteria for possible/probable beriberi.
- Of infants with possible/probable beriberi:
 - 60.4% were aged between 1-3 months
 - 41.7% had fever at or within three days prior to presentation
 - Of the 31 patients with available data, 64.5% had a Z score ≥ 0 . The median Z score for all 129 infants was 0.
- Of the limited available data regarding mothers of infants with possible/probable beriberi:
 - 47.9% reported a “taboo” or poor diet (of 27 cases)
 - All reported maternal symptoms of thiamine deficiency (of 9 cases)

Conclusions

This study informs our planned prospective study. A broader understanding of the sociocultural and nutritional factors leading to thiamine deficiency is required for implementation of public health interventions.

Poster Shift 2: Infancy

GROWTH PARAMETERS ACCORDING TO (EPI)MUTATION – CHARACTERISTIC OF POLISH PATIENTS WITH SILVER-RUSSELL SYNDROME AGED 0 – 3 YEARS

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Background and Aims

Silver-Russell syndrome (SRS) is a heterogeneous congenital imprinting disorder associated with hypomethylation of ICR1 domain at chromosome 11p15.5 (ICR1hm) or maternal uniparental disomy of chromosome 7 (mUPD7). SRS children are characterized by intrauterine and postnatal growth retardation, body asymmetry and feeding difficulties.

Methods

74 SRS patients (60 with ICR1hm – 30 boys and 14 with mUPD7 – 8 boys), without growth hormone therapy, were observed. The premature were included: 10 with ICR1hm (16.7%) and 8 with mUPD7 (57.1%). Body length and weight were measured on average 6±4 times during 3 years. Growth parameters were standardized by WHO Growth Standard and expressed as SDS scores.

Results

Body weight was smaller in both boys and girls with mUPD7 (-4.0±0.9 vs. -3.7±1.4 SDS, p=0.02; -4.6±0.9 vs. -3.7±1.2 SDS, p=0.0002), as well as body length (-3.6±0.8 vs. -3.3±1.6 SDS, p=0.03; -4.4±0.9 vs. -3.3±1.1 SDS, p=0.00003). The nutritional status assessed by BMI was also lower in mUPD7 group, but not statistically significant (boys: -2.8±1.3 vs. -2.5±1.4 SDS, girls: -2.5±1.2 vs. -2.3±1.5 SDS). The average growth rate was 10.6 cm/year in boys and 11.7 cm/year in girls in ICR1hm group, and 7.4 cm and 9.8 cm/year respectively in UPD7 group.

Conclusions

1. Growth parameters such as body length and weight were significantly lower in boys and girls with mUPD7 comparing to ICR1hm group.
2. The average growth rate in first 3 years of life was better in group with ICR1hm in both boys and girls

Poster Shift 2: Infancy

IS BREASTFEEDING DIFFICULTIES AN INVISIBLE PROBLEM? FACTORS ASSOCIATED WITH BREAST-FEEDING PROBLEMS AT FOUR AND SIX MONTHS

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Background and Aims

Human milk is the optimal and recommended food for the newborn infant because it contains optimal ingredients for healthy growth and development. In a previous study we could show in accordance with other studies that breastfeeding problems at one month is one of the main reasons for early breastfeeding cessation.

The aim of this study was to assess factors associated with breastfeeding difficulties at four and six months of age.

Methods

This study is part of a larger ongoing population-based longitudinal birth cohort study (H²GS) which has recruited infants born between 2007 and 2008 in the county of Halland, in south-western Sweden.

Results

At four months 78.7% were breastfeeding and 44.2% mothers experienced breastfeeding difficulties. At six months 58.3% were breastfeeding and 30.7 % experienced breastfeeding difficulties. The most common problem at four months was sore nipples 19.2 %. In the multivariate analyses maternal age (OR: 1.47; CI 1.00-2.17; 0.053); bottlefeeding (OR:0.35; CI 0.26-0.47; 0.000); nightmeal formula (OR:0.36; CI 0.24-0.55; 0.000) and prenatal education group (OR:1.42; CI 1.05-1.93) were correlated with breastfeeding problems at four months of age.

Conclusions

Breast feeding problems peaked at four months. We believe our findings provide compelling evidence of the importance to deal with breastfeeding problems not only as soon as possible but also continuously as long as the mother is breastfeeding.

Poster Shift 2: Infancy

CONTEXT ASSESSMENT IN GROWTH MONITORING

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Background and Aims

Growth monitoring is an important tool for counselling, prevention and interventions. Different contexts require different translation of measurement results. However, the extent to which context is taken into account in growth monitoring practices is limited. This study aims to analyse which and how contextual factors are being addressed in growth monitoring.

Methods

The protocols from three countries in different stages of the nutrition transition were compared.

Results

The Dutch growth monitoring protocol is directed towards diagnosing underlying pathology. It focuses on individual biological and genetic context with minimal reference to socio-cultural considerations. Extensive information concerning linear growth and overweight is provided for professionals but guidance on how to translate the information into advice to parents is not included.

In India growth monitoring focuses on socio-economic and cultural context. The protocol provides information about underweight and guides professionals on how to investigate local and individual norms, beliefs and practical problems. Advices and promotion strategies are locally adjusted and practical.

Growth monitoring in Tanzania focuses on standard contextual factors, like hygiene and illness. For professionals limited information is provided on interpretation of growth and underlying causes of either under- or overweight. Advices appear general with minimal appreciation of the local situation.

Conclusions

How and which context is included in growth monitoring activities differs between these countries reflecting their stage in the nutrition transition. In the Netherlands, the focus is on biological and genetic context; in India on socio-economic and cultural context, and in Tanzania environmental context.

Poster Shift 2: Infancy

A PARTLY FERMENTED INFANT FORMULA CONTAINING SCGOS/LCFOS(9:1) SHOWS AN EFFECT ON EATING BEHAVIOR IN INFANTS: THE LIFE STUDY

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Background and Aims

The first 1000 days influence later health. Besides the way food is offered, specific nutrients, such as fibers, may also have an effect on eating behavior. The effect of a partly fermented infant formula containing scGOS/lcFOS on gastrointestinal tolerance, growth and safety was investigated (LIFE study, NTR3455). Previous analysis suggests that the formula is well tolerated and supports adequate growth (Rodriguez-Herrera et al., 2016). The focus of the current abstract is limited to eating behavior outcomes.

Methods

In a randomized, controlled, clinical trial, healthy infants, were enrolled before 28 days of age and received one of two formulae until 17 weeks of age: 1) FIF+: infant formula consisting of 30% fermented formula and containing 0.8g/100ml scGOS/lcFOS or 2) IF-: non-fermented infant formula without scGOS/lcFOS. The Baby Eating Behaviour Questionnaire (BEBQ; Llewellyn et al., 2011) was used at baseline, 8 weeks and 17 weeks of age. Data were analyzed by ANCOVA.

Results

BEBQ data were completed for 70 infants in the FIF+ group and 76 infants in the IF- group. No differences were found between the 5 BEBQ scales at baseline or at week 8. At week 17, satiety responsiveness was higher ($p=0,018$), food responsiveness lower ($p=0,024$) and general appetite lower ($p=0,002$) in the IF+ group compared to the IF- group.

Conclusions

This study shows that the partly fermented formula with scGOS/lcFOS(9:1) provided during the first weeks of life, significantly influences eating behavior. The results are consistent with a healthy eating pattern (Llewellyn et al., 2011; Wardle et al., 2001).

Poster Shift 2: Infancy

MALNUTRITION AMONG HIV EXPOSED UNINFECTED INFANTS 24 MONTHS AND BELOW IN RESOURCE LIMITED SETTINGS: A CASE OF MUKURU SLUM IN NAIROBI, KENYA

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Background and Aims

With the successful chemoprophylaxis in the elimination of mother to child transmission of HIV, there is a rising number of HIV exposed uninfected (HEU) infants exposed to antiretroviral therapy for their survival during infancy. In resource limited settings, these infants are at a risk of malnutrition due to low birth weight, food insecurity, improper feeding patterns and risk of infections. This study reviewed malnutrition issues faced by this growing cohort of infants below 24 months in these settings.

Methods

A retrospective cohort study was performed on 160 mother/guardian-child pairs in Mukuru Slum, Nairobi, Kenya. Growth charts of the HEU infants was studied against a control group of HUU infants. Interviews to collect information on child feeding practices related to socio economic status, infections, ARV exposure and food insecurity were done.

Results

HEU infants have lower birth weights compared to the HUU counterparts. Out of 160 infants, HEU (n=90), HUU (n=70). Stunting among HEU infants was most common of malnutrition with 30%, followed by underweight (27%). 33.3% had normal weight while 9.7% were severely wasted. The incidence of low birth weight infants was higher than the HIV unexposed uninfected infants. Suboptimal postnatal growth of HEU infants was lower than in HUU since they were constantly hospitalized.

Conclusions

HEU infants are faced with a high malnutrition risk within the resource limited settings as compared to the HUU children in their first 24 months of life. It is necessary to foster future operational studies to inform HIV programs on ways to eliminate malnutrition among the rising number of HEU infants.

Poster Shift 2: Infancy

AN INNOVATIVE INFANT MILK FORMULA WITH LARGE, PHOSPHOLIPID-COATED LIPID DROPLETS SUPPORTS AN ADEQUATE GROWTH AND IS WELL-TOLERATED IN HEALTHY, TERM ASIAN INFANTS

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Background and Aims

Inspired by human milk, an innovative Infant Milk Formula (IMF) was developed containing large, phospholipid-coated lipid droplets (Nuturis®), providing a lipid droplet structure closer to human milk. The overall study objective was to evaluate the longitudinal effect of Nuturis® on growth and body composition development. This abstract described the 4 months safety outcomes.

Methods

In a randomised, controlled, double-blind, prospective clinical trial (VENUS), infants were enrolled before one month. When parents decided to introduce IMF infants were randomised to receive a standard IMF with (Control-1) or without (Control-2) prebiotics mixture, or the new IMF (Control-1 with Nuturis®). The group of subjects who were fully formula fed by one month of age formed the "key group of interest (KGOI)". Subjects still fully breast-fed at 4 months of age served as a reference group. Primary safety outcome was equivalence of daily weight gain of the KGOI who received Nuturis® versus Control-1 from randomisation to 4 months of age, with pre-defined equivalence margin of ± 3 g/day. In addition, adverse events and gastrointestinal tolerance were evaluated.

Results

Equivalence of daily weight gain was demonstrated between the Nuturis (n=35) and Control-1 (n=29) groups (mixed model analysis with correction for sex, age at the start of IMF, birth weight and ethnicity), also when compared to the reference group (n=66).

Frequency, severity or type of adverse events and gastrointestinal tolerance outcomes were not different in both IMF groups.

Conclusions

An innovative IMF comprising large, phospholipid-coated lipid droplets (Nuturis®) is safe, well-tolerated and supports adequate growth in healthy Asian infants.

Poster Shift 2: Infancy

PRE-MIDNIGHT AND POST-MIDNIGHT FEEDING CHARACTERISTICS OF 12-MONTH OLD INFANTS

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Background and Aims

Early life nutrition and feeding practices are important modifiable determinants of long-term metabolic health outcomes, including obesity, yet little is known about the circadian feeding pattern of infants. We aimed to describe the 24-hour feeding patterns of 12-month old infants and examine their associations with maternal and infant characteristics.

Methods

Mothers from the Growing Up in Singapore Towards healthy Outcomes (GUSTO) cohort study ($n=431$) reported dietary intakes of their 12-month old infant, including the respective feeding times using 24-hour dietary recall. Infants fed only from 0600-2359h were classified as pre-midnight feeders and those with feeds during 0000-0559h were considered post-midnight feeders.

Results

The overall mean daily energy intake was 773 (SD 227) kcal, comprising 51.8 (SD 7.8) % carbohydrate, 33.9 (SD 7.2) % fat and 14.3 (SD 3.2) % protein. There were 251 (58.2%) pre-midnight and 180 (41.8%) post-midnight feeding infants. Post-midnight feeders consumed higher daily energy, carbohydrate, fat and protein intakes than pre-midnight feeders (all $P<0.001$). The difference in energy intake originated from calories consumed during the post-midnight period. Majority ($n=173$) of the post-midnight feeders consumed formula milk during the post-midnight period. Using multivariate logistic regression with confounder adjustment, exclusively breastfeeding during the first six months of life was negatively associated with post-midnight feeding at 12-months (adjusted OR=0.31, 95% CI 0.11, 0.82, $P=0.019$).

Conclusions

This study demonstrates that post-midnight feeding was common and total daily energy intake was associated with the timing of feeding in 12-month old infants. We suggest that the circadian pattern of energy intake should be studied throughout infancy.

Poster Shift 1: Neonatal & Prematurity

MINERAL PROFILE OF PRETERM INFANT FORMULAS FOR PREMATURE BABIES COMMERCIALIZED IN ABIDJAN, COTE D'IVOIRE

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Background and Aims

In spite of its undeniable benefits, breast milk may be completed or replaced by infant formulas, particularly with premature babies. These formulas are enriched in various nutrients among which essential minerals. This study aimed to i) identify the marketing sites of preterm infant formulas, ii) evaluate the global mineral profile and iii) determine the content of five (5) essential minerals.

Methods

The study included an investigation in supermarkets, open markets and pharmacies of Abidjan. The analytical step was performed on samples sold in Abidjan. Global mineral profile was determined by Scanning Electron Microscopy. Determination of the content of five essential minerals was performed by Atomic Absorption Spectroscopy.

Results

Five different brands of preterm infant formulas were commercialized in Abidjan only in pharmacies. Depending on the brand, mineral profile showed the presence of six essential macro-minerals, five essential trace elements and other mineral elements. The content of five essential minerals did not vary by brand and were close to those in breast milk exception made for calcium. Global mineral profile and specific contents of essential minerals were in favour of catch-up growth, weight gain and prevention of various sicknesses such as anaemia in premature babies.

Conclusions

The study showed that mineral profile of all brands was similar. All the essential minerals were identified, which is in favour of catch-up growth and weight gain, main goals in premature babies.

Poster Shift 1: Neonatal & Prematurity

HUMAN MILK CALORIES AND PROTEIN CONTENT DURING NEONATAL ICU HOSPITALIZATION. IS THERE ANY CORRELATION WITH WEIGHT GAIN IN PRETERM AND LENGTH OF NICU STAY?

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Background and Aims

Considering the lack of evidence regarding daily composition of human milk (HM) from lactating mothers and its importance for preterm nutritional status and NICU outcomes, this study aimed to evaluate the HM calories and protein timepoints/day and its correlation with length of hospitalization and weight gain

Methods

Twelve healthy lactating mothers, aged 29.8 ± 7.9 years; whose preterm were hospitalized at NICU after childbirth were involved at protocol. A sample (3mL) of HM was analyzed daily from 4th day of admission until discharge. Human Milk Analyzer, properly calibrated, was used for nutritional composition analysis.

Results

The mean of birth weight and gestational age were $1822g \pm 347$ and $242 \text{ days} \pm 13$ (approximately 34 weeks) respectively. As we expected, as higher energy and protein content in HM, higher was the preterm total weight (both positive correlations at 95% confidence level). However, the weight gain timepoint/day was not necessary combined to HM nutritional composition measured by day (no correlations observed). The weight gain mean was $14.6 \pm 3.1/\text{day}$, considered not satisfactory for preterm. There were no clear pattern for calories and protein in the measured samples, even using absolute value, delta or minimum/maximum. There were no correlation with length of hospitalization and weight gain

Conclusions

This is a preliminary data. A higher number of participants will be involved. However, a relevant HM nutrient variation, mainly for energy, was observed/day. For future analysis, it is necessary to evaluate dietary intake of lactating mother and its correlation with the HM quality and preterm outcome

Poster Shift 1: Neonatal & Prematurity

EXCLUSIVE BREASTFEEDING AND SKIN-TO-SKIN CONTACT DURING FIRST 60 DAYS OF NEWBORN-INFANT LIFE: EXPERIENCE FROM VENEZUELAN MOTHERS

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Background and Aims

Exclusive breastfeeding (EBF) and skin-to-skin contact (SSC) are two worldwide recommendations with a low prevalence of 38% for EBF and unknown for SSC. The aim is to evaluate the practice of EBF from 1st to 60 days of the newborn-infant life and the SSC immediate after birth.

Methods

Descriptive and semi-longitudinal study that followed 58 mother-infants' dyads from first hours of the newborn to 60 days of life. We conducted personal interviews with mothers in a public hospital and followed them by telephone 7, 15, 30 and 60 days after labor. The main variables included EBF, SSC, labor, and demographics characteristics. SPSS v. 19 was used to analyze the data.

Results

First BF initiated at 7h 51' after labor; prevalence of EBF was 60,3% at the first day of the newborn, and increased to 91,4% when leaving the hospital. At 7, 15, 30 and 60 days of the infants life, EBF were 89,7%, 81%, 60,3% and 48,3% respectively. EBF began at 8h 51' afterbirth when cesarean was practiced in comparison with vaginal labor when EBF began at 5h 41' ($p < 0.000$). SSC after birth was 17,2%.

Conclusions

The recommendation of the World Health Organization (WHO) of EBF for 6 months of age and SSC after birth are far for being accomplished for these Venezuelan mothers. Practical and creative interventions during the first hours and days of the newborn life are needed to reach better long term goals.

Poster Shift 1: Neonatal & Prematurity

THE INFLUENCE OF FISH OIL LIPID EMULSIONS ON MORBIDITY AND NEURODEVELOPMENT OUTCOME IN VERY LOW BIRTH WEIGHT INFANTS

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Background and Aims

This observational study aimed to evaluate the effect of a parenteral nutrition lipid emulsion rich in DHA on the morbidity and neurodevelopment outcome in very low birth weight infants, when compared with a standard fat emulsion.

Methods

Premature infants with birth body weight less than 1500 gm admitted to neonatal intensive care unit at Kaohsiung Medical University Hospital were included in this study (Jan, 2011 ~ March, 2014). Group 1 (n = 50) received fish oil based lipid emulsion (SMOFlipid[®]) and Group 2 (n = 43) received soybean oil based lipid emulsion (Lipofundin[®]) from the first few days of life. Postnatal morbidity and neonatal outcomes were recorded. Chi-square test and Mann-Whitney U test were used to examine association between groups for categorical and continuous variables, respectively.

Results

Infants in the 2 groups were comparable with regard to demographic and clinical characteristics, except that the rate of cesarean section was higher in Lipofundin[®] group. There was a significantly lower risk of cholestasis ($p=0.011$) and shorter duration of TPN ($p=0.024$) in infants who received SMOFlipid[®]. The rate of bronchopulmonary dysplasia was also lower in SMOFlipid[®] group ($p=0.023$). No significant differences were found in cognitive and motor development based on BSID at 6 months old of corrected age between infants in the 2 groups.

Conclusions

Fish oil based fat emulsion administered from the first few days of life may be effective in the prophylaxis of **cholestasis** in very low birth weight infants who need intravenous lipid infusion.

Poster Shift 1: Neonatal & Prematurity

DETERMINANT FACTORS OF LOW BIRTH WEIGHT INFANTS : A CROSS SECTIONAL STUDY IN JAKARTA, INDONESIA

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Background and Aims

Low birth weight is an important factor that affects infant mortality rate (IMR) which becomes leading indicator of a country health status. Indonesia is still considered to have a high IMR with 22.8 infant deaths/1,000 live births in 2015. Many factors are reported and appears as a challenge for medical practice to identify high risk mothers. This study aims to describe low birth weight infants in Indonesia and to identify relevant factors that associates with low birth weight infants.

Methods

This is a cross-sectional study of patients born in a well-known private hospital for high-risk pregnancy located in urban area of Jakarta during January to December 2016. All living infants with birth weight under 2.500 gram are documented and correlated to maternal health, pregnancy, and demographic factors.

Results

There were 153 infants (6.7%) found with low birth weight during 2016. There were 143 infants that were included in the study with average birth body weight 2,043.32 grams. From these infants, factors that proven to have correlation with incidence of low birth weight are maternal age under 20 years, maternal age over 35 years, anemia status (Hb <11 g/dL) before labor, and gestational age.

Conclusions

The incidence of low birth weight infants is 6.7%. Maternal age below 20 or above 35, anemia status, and preterm pregnancy are associated with this incidence. These finding may be potential to use in preparing pregnancy and to early intervene low birth weight infants.

Poster Shift 1: Neonatal & Prematurity

EARLY FEEDING OF IUGR NEONATES AND POSSIBLE IMPLICATIONS

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Background and Aims

IUGR may complicate 10%-15% of all pregnancies and may have short-term and long-term metabolic, haematological, neurodevelopmental and growth consequences. The aim of our study was to identify if starting feeding IUGR babies early (D2) and increase their enteral feeding liberally (by about 25ml/kg/day), has this any influence in the incidence of NEC, their growth or the duration of hospitalization in NICU.

Methods

We retrospectively studied the medical records of all NICU admissions from 1/1/2007 till 31/12/2007 and we included these newborns that were diagnosed as IUGR in admission as it was documented by the obstetricians.

Results

Inclusion criteria were met by 19 newborns. Mean gestational age was 35,5 weeks (31 weeks-40 weeks) and mean B.W. 1697gr (760-2900).

All started enteral feeding on day 2 (2/19 with their mum's B.M.). Full enteral feeds were achieved on mean D8 (8-29). TPN started on day 2 in all the babies with mean duration 7,2 days (2-18). None of the babies had hypoglycaemia or cholestasis.

In 4 babies feeds had to be withdrawn because of bloody stools but none of the babies had confirmed NEC. The mean weight loss was 120gr, and all babies went back to their birth weight on day 7 (3-12). The mean duration of hospitalisation was 19,3 days (3-47).

Conclusions

Feeding IUGR babies early (day 2) didn't increase the NEC incidence, improved their growth and decreased the duration of hospitalisation. Our study is limited due to small sample size. Further studies need to be conducted so to establish an optimal feeding protocol for IUGR babies.

Poster Shift 1: Neonatal & Prematurity

WEIGHT GAIN IN MODERATELY PRETERM INFANTS BASED ON TYPE OF MILK AFTER DISCHARGE HOME

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Background and Aims

Preterm infants are often growth-restricted at hospital discharge and their nutrition post discharge is very important

To study if type of milk influences weight gain of moderately preterm infants (30 -33+6 weeks gestation) following hospital discharge.

Methods

Moderately preterm infants (30-33+6 weeks) gestation born over 18 months period (Jan 2015- June 2016) were retrospectively included in the study. Infants who had surgical problems and discharged to other hospital were excluded. Neonates who had their first follow up within 90 days were included and their weight, head circumference and method of feeding were noted.

There were total 53 preterm infants included and their mean weight was 1783g (631-2395). The average weight gain prior to discharge from neonatal unit was 6.1 g/kg/day and the first follow up ranged from 34-88 days

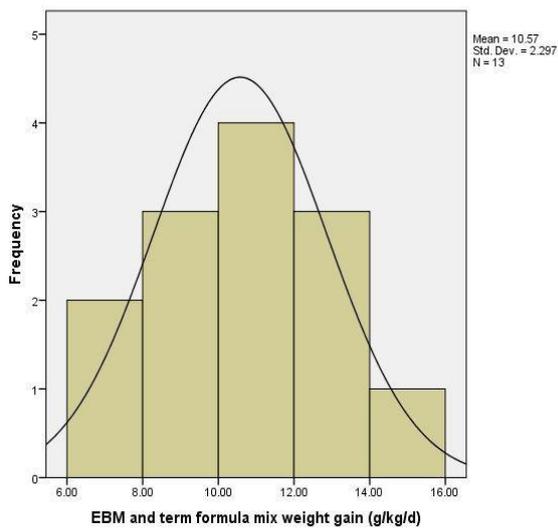
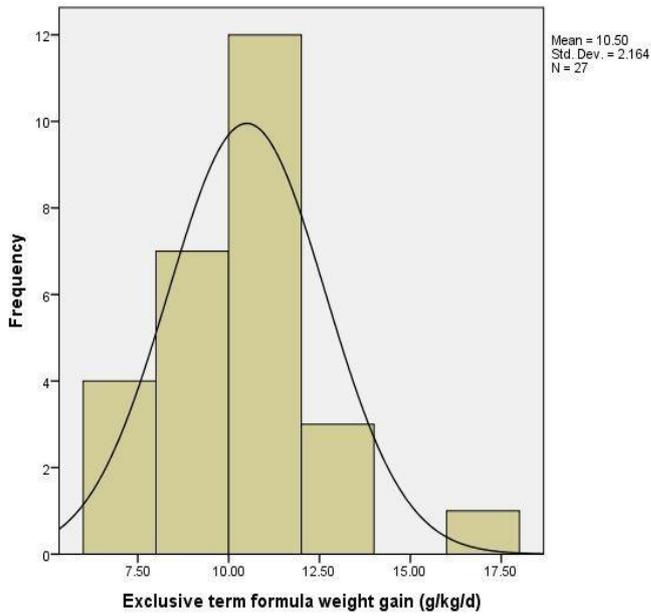
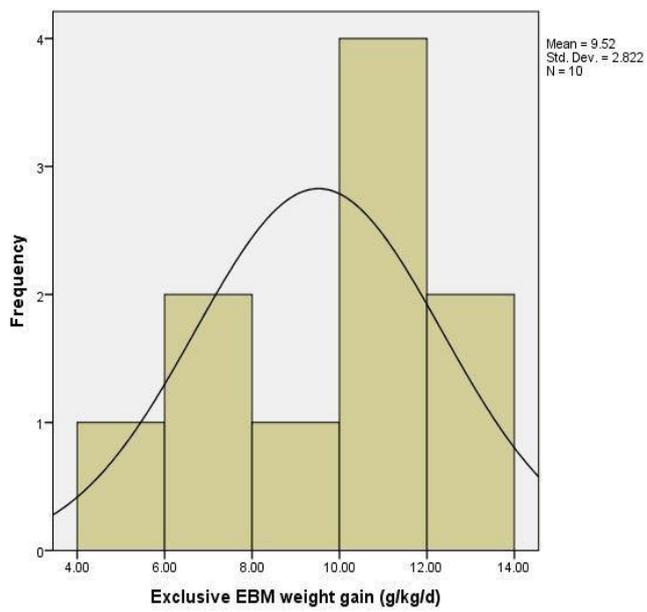
Results

Of 53 babies followed up, 10 - Exclusive mother's milk (MM) , 27- Term formula (TF), 13 - Mixed MM &TF , 3 - Preterm Formula(PF)

The mean weight gain for MM - 9.52 g/kg/day, TF 10.5 g/kg/day, MM+TF 10.57 g/kg/day and PF 11.4 g/kg/day.

On Student's-t test statistical analysis there was no significant difference between
1) MM with TF group (p 0.27) (Head circumference(HC) p 0.13)
2) TF with mixed MM+TF milk (p 0.92) (HC p 0.37)
3) MM with MM+TF milk (p 0.33) (HC p 0.11)

Small tendency towards decreased head circumference growth though statistically not significant in exclusively breast fed infants.



Conclusions

Weight gain after discharge between different milk groups was not statistically significant in moderately preterm infants

Poster Shift 1: Neonatal & Prematurity

THE IMPACT OF IRRIGATION OF BREAST ON COLONIZATION OF BREAST MILK

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Background and Aims

Breast milk health is one of the essential element in feeding of infants . In initial of breast feeding , different methods of disinfecting such as irrigation with usual detergents are used to eliminate the probable bacteria. Therefore we decided to study the importance of irrigation in different ways of breast milk expression, whether manually or by pump on mothers of low birth weight infants

Methods

This is a controlled clinical trial that evaluated result of breast milk culture in mothers of premature infants. Sample has been collected from breast of these mothers in four method; manual with and without irrigation and pump expression with and without irrigation. Each sample was collected for microbial cultur. In laboratory culture was done from each sample. If there was not grow of bacteria after 48 hours of culture the result was considered negative. Then data entered to computer and analyzed by SPSS 11.5.

Results

The results showed that the cultured bacteria in samples collected manually , with & without irrigation , were , staphylococcus coagulas negative , staphylococuse aurous , enterococ and klebseilla pneumonia. In pump expression samples , with & without irrigation , the cultured bacteria were consisted of : staphylococcus Coagulase negative , staphylococcus aurous , and enterococcus . Among the samples , in three samples of without irrigation and two samples of with irrigation , lack of growth of bacteria was observed

Conclusions

The results showed that cultured bacteria in pump samples were much more than manual samples

Poster Shift 1: Neonatal & Prematurity

HIGH PREVALENCE OF NONFERMENTATIVE BACILLI IN INTESTINAL MICROBIOTA OF SURGICAL ABDOMINAL NEONATES IN PARENTERAL NUTRITION

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Background and Aims

Rationale: Intestinal microbiota in the neonate is highly susceptible to perturbations of the luminal environment. Loss of gut symbionts bacteria due to surgical abdominal malformations (gastroschisis, omphaloceles), parenteral nutrition, delayed enteral feeding, prolonged antibiotic treatments or nursing in incubators, leads to an abnormal gut colonization and increase the risk of infections.

Methods

Methods: We evaluated the fecal microbiota of 10 neonates less than 5 months of age with parenteral nutrition, in an intensive care unit. Fecal sample were collected from all newborns at the same day and store at -80C until experiments. The fecal microbiota composition was evaluated using MiSeq sequencing approach and qPCR.

Results

Results: The results show a lower diversity in fecal microbiota composition, with a predominance of members of the Phylum Firmicutes, represented by the genera *Enterococcus* and *Streptococcus*, and Proteobacteria, mainly represented by the genera *Acinetobacter* and *Stenotrophomonas*, followed by *Escherichia* and *Enterobacter*. The qPCR results showed a reduced colonization by *Lactobacillus* and *Bifidobacterium*.

Conclusions

Conclusion: These results suggested that pathogenic bacteria colonizes the intestinal microbiota of these neonates, reflecting the absence of feeding and influences of the environment. These findings may contribute to the understanding of how intestinal disbiosis develops in critical newborn.

Poster Shift 1: Neonatal & Prematurity

GROWTH IN LATE PRETERM INFANTS DURING THE FIRST YEAR OF LIFE

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Background and Aims

Late preterm (LP) infants are born at a gestational age (GA) between 34^{0/7} and 36^{6/7} weeks. To date, few studies have evaluated growth during the first years of life in this group of newborns.

The aims are to evaluate growth of LP infants during their first year of life, and to identify any possible association with prenatal, perinatal and post-natal variables.

Methods

93 LP infants admitted to Neonatal Intensive Care Unit (NICU) in 2015 were enrolled. Patients were divided into three groups, based on GA: group 1 (34^{0/7}-34^{6/7} weeks); group 2 (35^{0/7}-35^{6/7} weeks); group 3 (36^{0/7}-36^{6/7} weeks). Infants were evaluated at 4, 8 and 12 months, maternal and fetal medical histories have been collected. Delta percent changes in length and weight ($\Delta\%$ L and W) during the follow-up time was calculated in all infants.

Results

Group 1 had a lower birth weight ($p<0.001$) and a significantly longer length compared to groups 2 and 3. Their $\Delta\%W$ at 3 ($p=0.02$), 6 ($p=0.01$) and 9 months of life ($p=0.01$) were significantly higher compared to group 2 and 3. Birth weight ($p=0.01$) and maternal 2 hour glucose values ($p=0.04$) after an OGTT significantly correlated with $\Delta\%W$ in group 1.

Conclusions

LP infants born at a GA between 34^{0/7}-34^{6/7} weeks showed a faster and prolonged catch-up growth compared to LP infants born above 35^{0/7}. Further studies are needed to characterize these peculiar patients and to clarify the possible association between rapid catch-up growth and late metabolic and cardiovascular complications.

Poster Shift 1: Neonatal & Prematurity

PROBIOTIC SUPPLEMENTATION FOR PRETERM NEONATES WITH MAJOR GASTROINTESTINAL SURGICAL CONDITIONS: A RETROSPECTIVE STUDY

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Background and Aims

There is limited information on the use of probiotics in neonates with gastrointestinal surgical conditions.

Objective: To document our experience with the use of probiotic *Bifidobacterium Breve* M16V in preterm infants with gastrointestinal surgical conditions.

Methods

Retrospective study. Neonatal databases were screened to identify preterm infants (<33 weeks gestation), who underwent surgery for major gastrointestinal conditions and received probiotics (January 2013 to October 2016).

Results

Thirty three preterm infants who underwent 43 gastrointestinal surgeries for various indications and received probiotics were included. The median gestational age at birth was 30 weeks (IQR: 26.8-30.7). Median age at the time of surgery was 5 days (IQR: 1-34). Of the 43 surgical procedures, 7 received probiotics only in the preoperative period (within 1 week prior to surgery), 5 received only in the preoperative period (more than a week prior to surgery), 24 received only in the post-operative period, and 7 received both in the pre-operative and post-operative period. The median post-operative age at the commencement of probiotics was day 10 (IQR: 6-13). The median duration of supplementation was 43 days (IQR: 34-56). The median number of doses was 70 (IQR: 61-100). 32/33 infants survived and were discharged home or transferred to secondary hospitals; only one infant died. None developed sepsis due to the administered probiotic organism.

Conclusions

Probiotics may be safe for use in preterm newborn infants undergoing bowel surgery. Well conducted RCT's are essential to identify the ideal probiotic species, optimal dose and duration of supplementation in this population.

Poster Shift 1: Neonatal & Prematurity

OLIGOSACCHARIDE ANALYSIS IN BREAST MILK FROM MOTHERS OF PRETERM INFANTS

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Background and Aims

Background: Human breast milk is widely accepted as the best source of nutrition for newborn babies. Oligosaccharides, a component of human milk, may protect against necrotizing enterocolitis.

Aims: To quantify a specific oligosaccharide (DSLNT) concentration in human breast milk and to evaluate the impact of pasteurization on this particular oligosaccharide.

Methods

Milk was collected from 31 NICU mothers. Samples were centrifuged, lipids and proteins were removed, and an internal standard was added to each sample. Samples were analyzed by LC/MS and DSLNT concentrations were normalized to the internal standard. Milk samples were pooled and pasteurized using either Holder (62.5 °C for 30 minutes) or flash (72 °C for 15 seconds) method.

Results

DSLNT concentration is not significantly affected by pasteurization. DSLNT concentration is strongly correlated to postpartum day ($r = -0.9716$, $p = 0.0011$), such that the highest levels of DSLNT are found in colostrum and transitional milk and lower levels in mature milk (milk expressed after day 21). Decreases in DSLNT levels from mothers that donated longitudinally were observed (decrease of $10 \pm 2.8 \mu\text{M}/\text{day}$). We observed a trend, albeit not statistically significant, towards an increase in NEC and SIP with lower levels of DSLNT in breast milk.

Conclusions

Understanding the components in breast milk that impart benefits to infants is not only critical to our understanding of how these protections are afforded, but may also provide us with novel preventative therapeutics or possible markers to assess which infants are at risk for NEC and other complications associated with prematurity.

Poster Shift 1: Neonatal & Prematurity

MATERNAL NUTRITIONAL SUPPLEMENTATION IN THE LAST TRIMESTER SIGNIFICANTLY IMPROVED BIRTH OUTCOMES IN VIETNAMESE MOTHERS

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Background and Aims

Maternal nutrition during pregnancy is critical for fetal growth and development. Improving nutrition in pregnant women has both short-term and long-term impacts on maternal and child health. This study aimed to evaluate the effects of maternal nutritional supplementation (MNS) in the last trimester on birth outcomes in Vietnamese mothers.

Methods

A total of 228 singleton mothers aged 20 to 35 years at 26 to 29 weeks of gestation with pre-pregnancy body mass index (BMI) <25.0 kg/m² were randomized to the intervention (n=114), receiving MNS (252 kcal/day) daily up to delivery or to the control (n=114), receiving standards of care. The infant's weight, length and head circumference (HC) were obtained at birth.

Results

MNS resulted in a higher birth weight (+92 g, 95%CI: 8-176, p=0.0312) and higher head circumference (+3mm, 95% CI: 0-6, p=0.0886). The MNS group also had significantly higher birth weight-for-age (+0.25 z-score, 95% CI: 0.05-0.45, p=0.0141) and head circumference-for-age z-score (+0.31z-score, 95% CI: 0-0.62, p=0.0460). The percentage of infants who were born small for gestation age (SGA) was lower in the MNS group based on birth weight and length, compared with the control group (p=0.0533 and p=0.0561 respectively). The percentage of infants with birth head circumference-for-age <-2 z-score was half of that observed in the control group (11.8% vs. 24.1%, p=0.0182).

Conclusions

MNS in the last trimester helped improve the infant's birth weight and birth head circumference, and reduce the risk of SGA, especially the risk of small birth head circumference.

Poster Shift 1: Neonatal & Prematurity

IMPACT OF NUTRITION SUPPORT TEAM ON NUTRITIONAL STATUS AND OUTCOME OF NEONATE UNDERGOING GASTROINTESTINAL SURGERY

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Background and Aims

Surgical treatment is the usual intervention for correction of gastrointestinal anomalies and nutrition is the key component in the postoperative management. The aim of this study is to evaluate the role of nutrition support team (NST) on postoperative nutritional status and clinical outcome in neonates who undergo operation due to congenital gastrointestinal anomalies.

Methods

This cross-sectional clinical study was carried out at two neonatal intensive care units (NICUs) in Dr. Sheikh Pediatric Hospital, Mashhad, Iran; One being supported by NST and the other not, during 2014-2015, when the staff of each NICU were almost the same. A total of 120 patients were included through a non-random simple sampling. Different variables such as weight gain in NICU, length of NICU stay, post-operative enteral nutrition initiation, duration of mechanical ventilation, mortality rate, and distribution of energy from enteral or parenteral routes were compared between patients of two NICUs.

Results

Mean weight gain and the amount of calorie delivered during NICU stay NST-supported patients were significantly higher (t-test, $p=0.003$ and <0.001 respectively), while no significant difference existed between length of NICU stay, enteral nutrition initiation after operation, ventilation days and mortality between two groups. Energy intake from aminoacid and intralipid during parenteral nutrition in NST-supported patients were significantly higher, while energy from dextrose was higher in patients who were not supported.

Conclusions

Activities of nutrition support teams in neonatal intensive care units can improve postoperative weight gain and calorie delivery as well as distribution of energy intake in neonates with gastrointestinal anomalies.

Poster Shift 1: Neonatal & Prematurity

FOLLOW UP OF NUTRITIONAL STATUS IN POSTOPERATIVE CONGENITAL DIAPHRAGMATIC HERNIA PATIENTS

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Background and Aims

Failure to thrive (FTT) is a common underlying condition in patients with Congenital diaphragmatic hernia (CDH). The aim of current study was to evaluate outcome, nutritional status and growth pattern and mortality in CDH patients.

Methods

In cross-sectional study, we investigated a total of 146 CDH patients who had undergone surgery in Dr. Sheikh Hospital, Mashhad, Iran between April 2006 to November 2014. Due to inaccessibility or lack of cooperation by some parents, 61 cases completed the study. Demographic variables including age, sex, family history of congenital anomalies, postoperative complications, developmental defect, and nutritional status were collected by interviews.

Results

Among the 61 studied cases, 32.7% had died during the initial 6-month after surgery. The mean age of participants was 24.21 ± 30.26 months. According to Z-score classification of weight for height following surgery, 7.3% had severe malnutrition, 4.8% moderate malnutrition and 24.3% mild malnutrition while 51.2% were normal. While current evaluation indicate that the majority of subjects were in the normal range.

Conclusions

Most children with congenital diaphragmatic hernia had a normal growth following surgery; however, few cases experienced a reduced growth rate in the early years of their life. Highlighting the need for additional calories to prevent FTT and other complications are recommended.

Poster Shift 1: Neonatal & Prematurity

A NUTRITION EDUCATION PROGRAM FOR THAI MOTHERS OF SMALL PRETERM INFANTS HELPED TO INCREASE EXCLUSIVE BREASTFEEDING RATE AFTER DISCHARGE

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Background and Aims

Breast milk has been acknowledged as a crucial nutrition for all infants, particularly preterm babies, mainly due to its high benefits for infant growth, development and immunity. However, the prevalence and duration of breastfeeding after discharge in preterm infants has continued to be less and shorter than that of full term infants. The current study aimed to evaluate the effectiveness of a nutrition education program on breastfeeding rate at post-discharge among Thai mothers of preterm infants.

Methods

A prospective non-randomized interventional cohort study was conducted at Buddhasothorn Hospital, Chachoengsao, Thailand. Thirty mothers with 31 preterm infants received the preterm infant nutrition (PIN) education program and were compared the results obtained from 30 mothers with 32 infants 1-2 years prior to the commencement of the study. Feeding type for the infants was recorded monthly until 6 months after birth. Data of infants in the historical comparison group were obtained from infant's in-patient charts and nutritional records at the follow-up clinic.

Results

Intervened mothers had lower transition rate from exclusive breastfeeding to mixed feeding at 3 months ($p = 0.03$) and 6 months ($p = 0.02$) after infant birth, and higher rate of exclusive breastfeeding at 6 months ($p = 0.02$) than the comparison group. However, total duration of breastfeeding and time to start semi-solid food between the groups was not significantly different.

Conclusions

The PIN education program resulted in higher exclusive breastfeeding rates for preterm infants' mothers, but did not affect breastfeeding duration and time to start semi-solid food.

Poster Shift 1: Neonatal & Prematurity

EARLY LIFE METABOLOMIC PROFILING REVEALS RISK FACTORS FOR INSULIN RESISTANCE IN EXTREMELY PRETERM INFANTS

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Background and Aims

Prematurity is a risk factor for insulin resistance. We hypothesized that these risks originate from the early life, and assessed longitudinal progression of lipidomic profile in preterm infants.

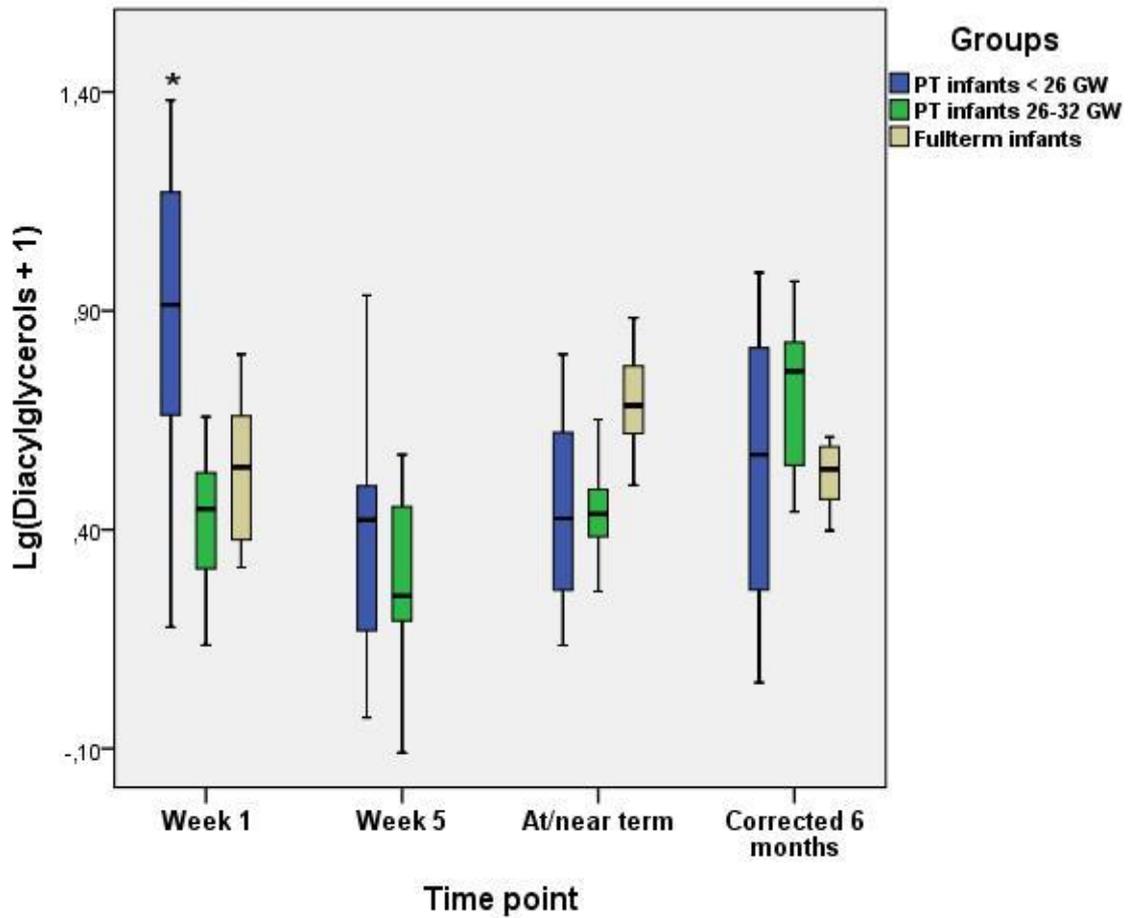
Methods

Preterm infants [n=35, gestation weeks (GW) <32+0] were divided into two groups, infants born <26 GW [n=17, mean birth weight (MBW) 670g (SD 135), 59% girls] and at 26 to 31+6 GW [n=18, MBW 1310g (SD 315), 44% girls]. Plasma lipidomic profiles were analyzed using ultra performance liquid chromatography coupled to electrospray ionization mass spectrometry at four time points (at 1 and 5 weeks, at/near term and at the 6 months corrected age) and compared to fullterm infants [n=10, GW 40+0 weeks, MBW 3600g (SD 375), 50% girls]. Lipid metabolites were classified into 10 major categories according to chemical structure, and comparisons were made using mixed model analyses.

Results

Significantly higher concentrations of diacylglycerols (Figure) and triglycerides (TG) with 3-5 double bonds were detected at the first time point (1 week after the birth) among the infants born < 26GW, compared to preterm infants born at 26 to 32 GW or full term infants (p-values

from <0.001 to 0.03).



* Comparisons between PT infants <26 GW and other groups at Week1, $p < 0.001$.
Comparison of PT infants <26 GWs at Week 1 to other time points, $p < 0.005$.

Conclusions

Diacylglycerols and TGs are categorized as glycerolipids and they may have a role in hepatic insulin resistance and type 2 diabetes. High concentrations of these metabolites at the early state of metabolic maturation may be an indicator for the aforementioned problems in the future.

Poster Shift 1: Neonatal & Prematurity

SEASONALITY VARIATIONS IN PREGNANCY NUTRIENT INTAKES AND INFANT BIRTH SIZE

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Introduction

Pregnancy dietary intake is associated with optimal birth weight and neonatal survival. Understanding seasonal variations in nutrient intakes is important for intervention planning in subsistence communities. The objective of this study was to examine variations in pregnancy dietary intakes across the agricultural seasons and associations between dietary intakes and birth size.

Methods

Dietary intakes of 334 pregnant women between 28 – 35 weeks gestation in a typical rural community in Malawi were studied using 24-hr interactive recall repeated on three non-consecutive days. Anthropometric measurements of the study participants' infants were measured (according to WHO guidelines) within one hour of birth. Multilevel linear regression was used to examine the association between dietary intakes and birthweight. Of the participants, 203 were sampled and followed up in the food-plenty season whilst as 131 were studied in the proceeding season, i.e. food-poor season.

Results

Median intakes of most nutrients were higher in the food-plenty season than in the food-poor season except for Vitamin B12, Calcium. Nevertheless, mean birthweight in the food plenty season (i.e. infants conceived at the peak of the food-poor season) was lower, being 3081±4g; whilst as being higher, 3212±3g, in the food poor season (i.e. infants conceived at the peak of the food-plenty season); p=0.0133.

Vitamin C intakes were positively associated with birth weight in the harvest season group. Vitamin B6, Iron and Thiamin intakes were associated with birth weight in the food poor season group.

Conclusion

Promoting nutrition at the start of pregnancy in the food-poor season could be beneficial.

Table 1: Median nutrient intakes (inter-quartile range) of 3rd trimester pregnant women during the food-plenty and food-poor seasons in Mangochi, Malawi

	Unit	2EAR (FAO/WHO/IOM)	Median nutrient intake (Inter-quartile range)	
			Harvest (food-plenty) season	Planting (food-poor) season
aEnergy	kcal	1NA	2096.5 (1778.1, 2570.6)	1863 (1505.4, 2520.9)
Macronutrients				
aFat	g/d	1NA	37.5 (21.9, 51.7)	34.6 (21.9, 51.1)
Carbohydrate	g/d	135	377.4 (306.0, 453.7)	324.8 (259.1, 403.7)
Protein	g/d	59	55.1 (45.6, 66.6)	52.6 (42.7, 64.8)
bFiber	g/d	28	38.0 (30.3, 48.1)	31.0 (24.1, 43.9)
Micronutrients				
cVitamin A	µg RE/d	571	242.9 (156.0, 346.2)	206.7 (111.0, 368.7)
Vitamin C	mg/d	46	100.4 (60.2, 153.9)	70.1 (43.1, 142.6)
Folate	µg/d	480	234.1 (175.9, 327.2)	170.3 (129.6, 231.2)

Vitamin B12	µg/d	2,2	1.7 (0,4, 3.5)	3.1 (1.5, 6.0)
Vitamin B6	mg/d	1,6	1.6 (1.3, 2.0)	1.5 (1.2, 1.9)
Niacin	mg/d	14	10.3 (8.4, 13.2))	10.8 (7.9, 13.6)
Thiamin	mg/d	1,2	1.5 (1.2, 1.9)	1.3 (1.0, 1.7)
Riboflavin	mg/d	1,2	0.6 (0.5, 0.8)	0.7 (0.5, 0.8)
dZinc	mg/d	11,7	8.7 (7.1, 10.4)	7.8 (6.1, 9.9)
Calcium	mg/d	833	283.6 (222.2, 371.2)	290.1 (210.9, 411.4)
elron	mg/d	>40,0	16.0 (12.7, 20.9)	14.3 (11.0, 18.6)

Differences in median intakes nutrient intakes not statistically significant.

NA, not available; 2EAR, estimated average requirements; IOM, Institute of Medicine; FAO, Food And Agriculture Organization of the United Nations; WHO, World Health Organization;

IOM's estimated average requirements are used for macronutrients, whereas WHO/FAO's estimated average requirements are used for micronutrients due to the issue of bioavailability of zinc and iron.

a Estimated average requirements not available for energy and fat.

bFor fiber the Adequate Intake is used as there is no EAR estimated.

c1 RE = 1µg retinol = 12µg β-carotene or 24µg other provitamin A carotenoids. In oil, the conversion factor for vitamin A (retinol): β-carotene is 1:2. The corresponding conversion factor for synthetic β-carotene is uncertain, but a factor of 1:6 is generally considered to be reasonable. 1 µg RE = 3.33 IU vitamin A.

dThe calculated EAR depends on the composition of the diet. This diet was poor in animal protein, and bioavailability of zinc was thus considered low.

eThe calculated EAR depends on the composition of the diet. This diet was low in animal protein, and vitamin C was not combined in meals with animal protein. The bioavailability of Iron was thus considered low.

Table 2: Infant birth size in the food plenty and food poor season in Mangochi, Malawi

	Food-plenty (harvest) season		Food-poor (planting) season		P-value
	N	Mean±SD	N	Mean±SD	
Birthweight	130	3081,10 ± 4	64	3212,20 ± 3	0.0266
Birthlength	130	47,80 ± 3	64	49,20 ± 2	0.0002
HeadCircumference	130	34,50 ± 2	64	35,20 ± 1	0.0052
Abdomen Circumference	130	30,70 ± 3	64	30,70 ± 1	0.9309
Placenta_g	130	566,50 ± 1	64	609,50 ± 1	0.0466

Table 3: Association between 3rd trimester pregnancy nutrient intakes and infant birth size during the food plenty and food poor seasons in Mangochi, Malawi

	Food-plenty (harvest) season β (95% CI)	P-value	Food-poor (hungry) season β (95 % CI)
Macronutrients			
Fat	10.51 (-1.23, 22.25)	0.08	-43.46 (-1538.57, 1451.64)
Carbohydrates	-9.23 (-20.35, 1.88)	0.1	-446.11 (-1656.57, 764.35)
Protein	2.39 (-38.18, 42.96)	0.91	-85.28 (-4161.91, 3991.34)
Fiber	9.20 (-52.16, 70.55)	0.77	12111.23 (5127.41, 19095.04)
Micronutrients			
Vitamin A	0.28 (-0.09, 0.64)	0.14	0.44 (-0.07, 0.96)
Vitamin C	1.36 (0.46, 2.25)	< 0.01	0.25 (-0.76, 1.26)
Vitamin B12	20.95 (-9.41, 51.31)	0.18	-1.43 (-27.67, 24.82)
Vitamin B6	15.43 (-155.76, 186.62)	0.86	211.37 (7.53, 415. 21)
Calcium	0.50 (-0.12, 1.12)	0.11	0.39 (-0.16, 0.94)
Iron	-1.09 (-15.52, 13.35)	0.88	24.29 (5.27, 43.30)
Zinc	14.87 (-22.63, 52.37)	0.44	25.03 (-16.57, 66.64)
Folate	-0.44 (-1.17, 0.28)	0.23	1.13 (-0.37, 2.62)
Niacin	8.11 (-6.02, 22.23)	0.26	13.91 (-5.42, 33.23)
Thiamin	14.04 (-132.91, 160.99)	0.85	261.22 (84.74, 437.69)
Riboflavin	209.49 (-5.38, 424.35)	0.06	496.54 (-215.61, 1208.68)

Poster Shift 1: Neonatal & Prematurity

VITAMIN D DEFICIENCY AMONG POSTPARTUM WOMEN AND THEIR NEWBORNS: A CROSS-SECTIONAL STUDY

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Background and Aims

Vitamin D deficiency during pregnancy has been linked with number of serious short and long term health problems in offspring, therefore adequate maternal vitamin D levels are pivotal for neonatal calcium hemostasis. The objective of this study is to evaluate vitamin D deficiency among post-partum women and their newborns.

The aim of the study was to determine the prevalence of vitamin D deficiency in mothers and their newborns.

Methods

360 pregnant women were enrolled. Serum levels of 25-hydroxyvitamin D₃ were assayed in maternal and cord blood samples collected at the time of delivery. Also the samples from their newborns were collected.

Results

The prevalence of vitamin D deficiency in maternal and cord blood was 69.6% and 58.2% respectively. There was significant correlation between maternal and cord blood serum concentration of Vitamin D₃. In mothers who were deficient in Vitamin D₃, cord blood Vitamin D₃ levels were lower than those from normal mothers. (P=.001). A significant direct correlation was also found between parda/veil observers mothers and levels of Vitamin D₃ (P<0.002).

Conclusions

Keeping in view the high prevalence of vitamin D deficiency, considerations should be made for Vit.D supplementation in antenatal period to prevent hypovitaminosis in both mother and babies.

Poster Shift 1: Neonatal & Prematurity

MATERNAL CONSUMPTION OF FRUITS AND VEGETABLES/VITAMIN C DURING PREGNANCY IS ASSOCIATED WITH FETAL AND INFANT GROWTH UP TO 6 MONTHS

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Background and Aims

The aim of this study was to investigate whether maternal intake of vitamin C, which is abundant in fruits and vegetables, is associated with fetal and infant growth.

Methods

The study participants were 1,138 Korean pregnant women at 12-28 weeks gestation with their infants recruited for the Mothers and Children's Environmental Health study. Fruits and vegetables/vitamin C intake during pregnancy was assessed by 24 hour recall method. Fetal biometry was assessed by ultrasonography at late pregnancy, and the infant weight and length were measured at birth and at 6 months.

Results

Maternal intakes of fruits and vegetables and vitamin C were negatively correlated with urinary malondialdehyde levels at mid pregnancy. The multiple regression analysis after adjustment for covariates showed that maternal fruits and vegetables intake was positively associated with biparietal diameter of fetus and infants' weight during birth to 6 months; maternal vitamin C intake was positively associated with abdominal circumference of fetus and infant birth length. The multiple logistic regression analysis revealed a significant inverse relationship between fruits and vegetables consumption and the risk of low growth (<25 percentile) of biparietal diameter and weight at birth; There was a significant inverse relationship between vitamin C consumption and the risk of low growth (<25 percentile) of weight at birth, weight during birth to 6 months, and length at birth.

Conclusions

The results of this study suggest that higher intake of fruits and vegetables and vitamin C at mid-pregnancy is associated with increased fetal growth, and infant growth up to 6 months of age.

Poster Shift 1: Neonatal & Prematurity

PLETHYSMOGRAPH APPLICATION IN THE BODY WEIGHT COMPOSITION IN PREMATURE INFANTS IN COMPARE OF NATURAL AND ARTIFICIAL FEEDING

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Background and Aims

In prospective open study was made an evaluation growing body mass composition of premature infants depending on the type of feeding and gestational age. Excessive fat mass may be a predictor of development of socially significant diseases in older age.

Methods

37 premature infants were assessed in their physical development by measuring anthropometric parameters (head circumference, chest circumference, length and body weight) and determination of body composition by the usage of plethysmograph at the moment of birth, the moment of the hospital discharge and post-conceptual age of 40 weeks gestational age.

Results

Anthropometric parameters at birth was 25-75 percentile, which corresponds to the age norm (Z-score body weight -0.4 ± 0.78 , head circumference -0.3 ± 0.76 and length -0.5 ± 1.26). At the hospital discharge anthropometric parameters were worse – body weight Z-score 2.1 ± 0.93 , head circumference -0.85 ± 0.77 and length -1.31 ± 1.18 . Using Fanton scale.

Were formed two groups up to 30 weeks (mean gestational age 28.8 weeks) and older than 30 weeks (mean gestational age 33.7 weeks). Z-score of the percentage of fat mass was equal to $0,375 \pm 0,34$ and $0,14 \pm 0,8$ ($p > 0.05$).

The neonates were divided into groups according to the type of feeding. In group of breastfed children and not breastfed Z-score of fat mass is equal to $0,29 \pm 0,69$ and $0,03 \pm 0,81$ ($p > 0.05$).

Conclusions

This study shows that significant differences in the composition of body weight in premature newborn depending on gestational age and type of feeding were not received. The lack of significant difference likely due to small sample. To optimize the physical development of infants and their feeding needs further study.

Poster Shift 2: Neonatal & Prematurity

LIPID PROFILE IN WOMEN AT RISK OF PREECLAMPSIA ACCORDING TO EPICATECHIN AND THEOBROMINE SERUM CONCENTRATIONS

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Background and Aims

Evidence reports abnormal lipid profile as a risk factor associated with increased blood pressure in pregnancy and preeclampsia (PE). Beneficial effects of chocolate on lipoprotein levels are documented. However, no study has investigated the impact of flavanols and theobromine, two major constituents of dark chocolate, on lipid profile in pregnant women at risk of PE. In this context, serum concentrations rather than dietary intakes should be studied due to inter-individual differences in the absorption and metabolism of bioactive compounds. **Objectives:** To assess lipid changes in pregnant women at risk of PE according to epicatechin, a flavanol, and theobromine serum concentrations 12 weeks following daily chocolate consumption.

Methods

A randomized controlled trial was conducted in 131 pregnant women. Retrospective analyses have been performed according to median theobromine and epicatechin concentrations at week 12 (high versus low).

Results

Greater increases in HDLc and lower increases in total to HDLc ratio and triglyceride concentrations were observed in women with high theobromine concentrations at week 12 compared to women with low theobromine level ($p \leq 0.0473$). No significant differences were noted in lipid changes in women according to epicatechin concentrations. No significant differences were observed in the rate of preeclampsia according to either theobromine or epicatechin concentrations.

Conclusions

Our results suggest that deterioration of lipid profile occurring during pregnancy could be in part counteracted by theobromine from regular consumption of dark chocolate, but its impact on the prevention of PE remains to be shown.

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Poster Shift 2: Neonatal & Prematurity

WHEN AND WHY DO VERY PRETERM INFANTS ACCUMULATE FAT?

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Background and Aims

Very preterm (VPT) infants experience poor post-natal growth relative to intrauterine growth rates. Despite poor growth VPT infants at term equivalent age have increased fat mass percentage (%FM) compared with infants born at term. The aim of this study was to assess growth and body composition in VPT infants from 32weeks post-menstrual age.

Methods

Growth and body composition were assessed using the PEAPOD Infant Body Composition System to measure %FM and fat free mass (FFM) in VPT infants (n=100) born before 32weeks gestation and studied at 32-36weeks. Body composition was compared to a control group of preterm infants (n=88) born at 32-36weeks gestation and measured on day 2 to 5 postnatally.

Results

At 32-36weeks, the VPT infants had a significantly greater %FM compared to control infants. Absolute FM was also significantly elevated. At 32-36 weeks VPT infants had a significantly lower FFM (g) compared to control infants. The trajectory in %FM over increasing postnatal age in the VPT infants was closely aligned to that observed in healthy full term infants. There was no relationship between %FM and antenatal or postnatal steroid exposure.

Conclusions

Preterm infants accumulate fat rapidly soon after birth. The rapid increase in %FM is predominantly due to increased fat accretion although reduced growth of FFM also contributes to the increased proportion of fat. Fat accretion may be triggered by events associated with birth. Interventions directed at improving VPT infant growth must include body composition outcomes as anthropometric measures such as weight are insufficient indicators of growth quality.

Poster Shift 2: Neonatal & Prematurity

GROWTH IN LOW BIRTH WEIGHT AND VERY LOW BIRTH WEIGHT INFANTS FED FORTIFIED BREAST MILK VERSUS FORMULA MILK: A RETROSPECTIVE COHORT STUDY

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Background and Aims

There has been a dramatic rise in preterm births in developed countries owing to changes in clinical practices and greater use of assisted reproductive techniques. Few studies have examined the growth and outcomes of preterm infants according to the type of feeding. The aim of this study was to examine the effect of breast milk feedings and formula on the growth and short-term outcomes of preterm infants in Hong Kong.

Methods

A single-center retrospective cohort study was employed. From 2010-2014, we included 642 preterm infants at gestational age < 37 weeks with birth weights > 750 g and < 2500 g.

Results

466 were classified as low birth weight (LBW) infants and 176 were classified as very low birth weight (VLBW) infants. The mothers of approximately 80% of VLBW infants and 60% LBW infants initiated breast milk feeding. When compared with no breast milk intake, LBW infants that received breast milk were significantly more likely to have growth z-scores closer to the median of the reference population and experienced slower weight gain from birth to discharge (See Fig.1). When breast milk was categorized by percent of total enteral intake, significant differences were seen among LBW infants, with lower percentages of small-for-gestational-age (SGA) status at discharge with increased proportions of breast milk intake.

Conclusions

LBW infants showed slower growth when predominately fed fortified breast milk than those solely fed formula. Overall, LBW infants fed breast milk had better growth z-scores and lower SGA status at discharge compared with those predominately fed preterm formula.

Poster Shift 2: Neonatal & Prematurity

IS MATERNAL NIGHT-TIME FASTING ASSOCIATED WITH OFFSPRING BIRTH SIZE AND ADIPOSITY?

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Background and Aims

With emerging evidence that prenatal circadian rhythm influences fetal outcomes, it is plausible that maternal daily fasting period may also play a role in fetal growth and body fat accretion. We examined the associations of maternal night-fasting interval during pregnancy with offspring birth size and adiposity.

Methods

Among 384 mother-offspring pairs from a Singapore prospective cohort, maternal night-fasting interval at 26-28 weeks' gestation was determined from a 3-day food diary based on the average of the longest fasting duration at night (1900-0659h). Offspring birth weight, length and head circumference were measured and converted to weight-for-gestational age (GA), length-for-GA and head circumference-for-GA z-scores respectively using local customized percentile charts. Neonatal percentage total body fat (TBF) was derived using a validated prediction equation. Multivariable general linear models, stratified by child sex, were performed.

Results

Mean (standard deviation) maternal night-fasting interval was 9.9 (1.3) hours. In infant girls, each hourly increase in maternal night-fasting interval was associated with a 0.22 unit (95%CI 0.05, 0.40) increase in birth head circumference z-score and a 0.84% (0.19, 1.49) increase in birth TBF, adjusting for confounders. In infant boys, no associations were observed between maternal night-fasting interval and birth sizes or TBF.

Conclusions

Increased night-fasting interval in the late-second trimester of pregnancy is associated with increased birth head circumference and TBF in girls but not boys. Our findings accord with previous observations suggesting sex-specific responses in fetal brain growth and adiposity, and raise the possibility of maternal night-fasting interval as an underlying influence.

Poster Shift 2: Neonatal & Prematurity

THE EVALUATION OF KNOWLEDGES AND MATERNAL PREPARATION ON BREASTFEEDING THE NEW BORN BABIES IN MATERNITY WARD OF VLORA'S REGIONAL HOSPITAL DURING 2015

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Background and Aims

Breastfeeding is a challenge nowadays because there are numerous factors affecting new mothers in deciding how the child will be fed. This is one of the most important ways to improve infant survival rates.

Aim: To evaluate knowledge and maternal preparation on breastfeeding their babies in Maternity Ward of Vlora's Regional Hospital during 2015

Methods

This was a cross-sectional and descriptive study conducted at the Maternity ward of Vlora's Regional Hospital, Albania during the 2015. Data were collected through a standard questionnaire in a single stage distributed to new born mothers. Only 247 mothers wanted to participate in this survey. Was gathered important information for mother's social demographic data, the knowledge they had for the breastfeeding and how they started to fed their babies.

Results

41% of mothers were aged 20-30 years. 40% of mothers had higher education. 55% were from the villages and 45% from town. 35% of mothers were jobless. 63% of mothers had their first birth; the rest had the second ore more births. 41% of new mothers had no information on breastfeeding before having birth. The information was given to mothers from nurses in 57% of cases. 70% of mothers are aware of what the child benefits from breastfeeding. During 2015, 67% of mothers breastfed their babies and others fed their babies with artificial milk.

Conclusions

New mothers need more information on the benefits of breastfeeding. Feeding in the early hours after birth was mostly done with formula milk.

Poster Shift 2: Neonatal & Prematurity

THE EFFECT OF GESTATIONAL DIABETES ON HUMAN MILK MACRONUTRIENTS CONTENT

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Background and Aims

Little is known about the effect of gestational-diabetes (GD) upon macronutrients content of human-milk (HM).

We aimed to study macronutrients (fat, lactose, protein) and caloric content in HM from women with GD compared to women with no-GD.

Methods

Sixty-two lactating mothers (31 with GD, 31 without GD) were recruited. Diagnosis of GD was made by using a 100-gram Glucose-Tolerance-Test. After manual expression each mother contributed 3 samples of HM (during the first 72 hours after labor (colostrum), after 7-days (transitional-HM) and at 14-days post-partum (mature-HM)). Immediately following expression, samples were stored at -20°C until thawed and analyzed using infrared transmission spectroscopy HM analyzer.

Results

Sixteen women (52%) in the GD group were treated by diet alone (48%) while 15 (48%) by pharmacotherapy. The non-GD and GD groups did not differ in terms of maternal age, maternal pre pregnancy weight, height, diet and weight gain during pregnancy, gestational age and infant birthweight. A total of 186 HM milk samples were collected. Macronutrients content in colostrum and transitional milk did not differ between the 2 groups. Fat and energy contents in mature HM were higher in the non-GD samples than in the GD samples ($p=0.07$ and $p<0.02$, respectively). There were no differences in macronutrients content of samples of mother with diet-treated-GD compared to mother with pharmacotherapy-treated-GD.

Conclusions

Fat and energy content of mature milk obtained from mothers with GD is lower compared to that of milk from mothers without GD. The mechanism and biological significance of our findings is yet to be determined.

Poster Shift 2: Neonatal & Prematurity

EATING HABITS OF YOUNG WOMEN AND THE RISK OF FERTILITY PROBLEMS

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Background and Aims

Infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months of regular unprotected sexual intercourse. According to research, there is a link between diet, and the incidence of ovulatory infertility.

The objective of the paper was to obtain information from girls between the ages of 17 and 23 on their life style, including dietary attitudes in the context of fertility disorders that are inherent to dietary habits and life style.

The paper aims to find out priorities for actions related to reproductive health promotion.

Methods

100 students of high schools. The average age was $18,22 \pm 1,29$.

The study involved a medical survey on issues of girls of the childbearing age prepared by an interdisciplinary team of doctors and dieticians. The study involved an Eating Attitude Test-26 questionnaire as well.

Results

56% of the girls ate sweets every day, 36.56% ate fast food every day. 47% had no breakfast before going to school. It was determined 36% smoked cigarettes. What is more, 29% of the girls have at least once been on a weight loss diet, which resulted in inhibition of menstruation in 8% of them. Eating attitude disorders were found in 9% of the young women.

Conclusions

Health education standard represented by the girls is low. Their dietary habits are alarming and may in time cause adverse health problems. According to the study, women of childbearing age should be provided with an educational programme that would include issues related to correct health promoting behaviour.

Poster Shift 2: Neonatal & Prematurity

KANGAROO MOTHER CARE AND GROWTH

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Background and Aims

The aim of study was to compare the effect of Kangaroo mother care (KMC) and conventional methods of care (CMC) in growth of low birth weight babies less than 2000 grams birth weight in Emamareza hospital.

Methods

One hundred low birth weight babies less than 2000 grams birth weight and without clinical problem were randomized in two groups, the intervention group (N=50) received Kangaroo mother care and the control group (N=50) received conventional care. Two groups were compared in daily weight gaining. Collected data was analyzed by SPSS 11.5 software.

Results

Two groups were the same in birth weight, entrance age to study, gestational age, and intrauterine growth. The KMC babies had better average daily weight gaining 31.18 ± 7.57 gm vs 16.57 ± 4.8 gm ($P < 0.001$) in CMC.

Conclusions

In this study Kangaroo mother care has better effect on daily weight gaining, in low birth weight neonates.

Poster Shift 2: Neonatal & Prematurity

ASSOCIATION BETWEEN MATERNAL SOCIO-DEMOGRAPHIC FACTORS AND INFANT BIRTH WEIGHT IN SAVELUGU

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Background and Aims

Birth weight is considered the single most important predictor of infant mortality, especially deaths within the first month of life. The main objective of the study was to determine the association between maternal socio-demographic characteristics and infant birth weight (BW) in Savelugu.

Methods

An analytical cross-sectional study design was used. In all 151 women attending post-natal clinic at the Savelugu hospital were recruited for the study. Birth weights of babies were obtained from their weighing cards. Structured questionnaire was then used to capture maternal socio-demographic characteristic, reproductive history, birth spacing, health issues and antenatal visits, food habits and nutritional issues and household hygiene practices. Frequencies and percentages of variables were obtained using SPSS. Chi square was used to test for statistical significance of $p < 0.05$ within the Confidence Interval of 95%.

Results

Maternal age was found to be significantly associated with low birth weight (**P = 0.00**). Maternal health during pregnancy was significantly associated with low birth weight (**P = 0.00**). A total of 30 babies of low birth weight were recorded for mothers who had ≤ 4 antenatal visits while 12 babies of LBW was found in mothers with ≥ 4 antenatal visits. Antenatal visits were significantly associated with low birth weight (**P = 0.00**). Maternal education level was also found to be significantly associated with low birth weight (**P = 0.001**).

Conclusions

Maternal age, health during pregnancy, number of antenatal visit, highest education level were found to be significantly associated the incidence of LBW in Savelugu.

Poster Shift 2: Neonatal & Prematurity

IMPLEMENTATION OF A QUALITY CONTROL IN PARENTERAL NUTRITION FOR NEONATES.

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Background and Aims

It is recommended to carry out a quality control on parenteral nutrition (PN). Specially, after errors occur in the preparation of PN, with clinical relevance. We implement a physicochemical quality control on the PN of neonates at Neonatal Intensive Care Unit (NICU).

Methods

Cobas702 (Roche Diagnostic®) is used for measurement of glucose (hexokinase), potassium (indirect-potenciometry) and calcium (NM-BAPTA), and DimensionEXL (Siemens®) for magnesium (complexometry test).

Collected 111 samples of NP "all in one" from 14/09/16 to 04/11/16.

Results

111 PN of 11 different neonates and first day PN standardized.

Mean weight at beginning of PN was 1.48 kg, and 1.58 kg at the end (weight gain 100 g).

Mean duration PN 7.64 days (3-13).

Diagnosis: extreme-prematurity (27.27%), moderate-prematurity (9.09%), mild-prematurity (36.36%), septic-shock (9.09%), bacterial meningitis (9.09%) and respiratory distress syndrome (9.09%).

Mean of nutrients was: glucose 15.05 g, potassium 1.7 mEq, calcium 2.65 mEq and magnesium 0.34 mEq. Mean absolute error between measured amount and prescribed was: glucose 4.45%, potassium 5.24%, calcium 3.09% and magnesium 15.43%. Glucose and calcium had most positive errors (88% and 72%), so value label is higher than laboratory value. Potassium and magnesium had most negative errors (81% and 100%).

Conclusions

Analytical technique has been validated for measurement of glucose, potassium and calcium. Nevertheless, another method must be developed for magnesium, due to interference with lipids from PN.

Although the short time of study, any incidence has been detected after administration of PN. This control is an useful tool to ensure quality, but final aim is to have results before dispensing.

Poster Shift 2: Neonatal & Prematurity

THE RELATIONSHIP BETWEEN HYPERGLYCEMIA DURING THE FIRST 24 HOURS POST- SURGERY WITH THE TYPE OF CALORIE INTAKE IN THE NEONATAL INTENSIVE CARE UNIT (NICU)

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Background and Aims

Surgery is a major cause of stress due to the disruption of homeostasis and physical balance. The aim of this study was to determine mean blood glucose during the first 24 hours' post- surgery and its relation with the composition of calorie intake.

Methods

Information of this observational retrospective study was collected through hospitalized medical records. 45 newborn infants suffered from atresia in different parts of the gastrointestinal tract and were candidate for open abdominal surgery from October to September 2015 were studied. 4 times blood glucose within 24 hours after surgery were taken by glucometer. Mean blood glucose during this period was calculated. Independent Student T Test, Chi-square tests and logistic regression were used to assess the association between postoperative blood glucose with calorie and macronutrients intake.

Results

In 33% of neonates, mean blood glucose during the first day after surgery was ≥ 180 mg/dl, and the rest of them had mean blood glucose of 40 to 179 mg/dl. There was significant relationship between $BG \geq 180$ mg/dl and calorie (P-value=0.001), macronutrients (carbohydrate (P-value<0.001) and fat (P-value=0.04)) intake. After adjusting for confounding variables, carbohydrate intake was found as independent factor on increasing $BG \geq 180$ mg/dl during the first 24 hours after surgery (P= 0.01) and also fat intake was found as effective factor on decreasing $BG \geq 180$ mg/dl during this time (P=0.04).

Conclusions

The present study showed that a significant relationship can be found between mean blood glucose during the first 24 hours after surgery and intake of macronutrients (carbohydrate and fat).

Poster Shift 2: Neonatal & Prematurity

BIRTH WEIGHT AND POSTNATAL GROWTH IN PRETERM BORN CHILDREN ARE ASSOCIATED WITH CORTISOL DURING EARLY INFANCY, BUT NOT AT AGE 8 Y

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Background and Aims

Preterm birth and being born small-for-gestational-age (SGA) have been associated with increased hypothalamic-pituitary-adrenal (HPA-) axis activity and increased cardiometabolic risk later in life. To explore HPA-axis development in children born preterm, we assessed cortisol from term age to age 8y, in association with birth weight (BW) SDS, SGA-status and growth from birth to 6 mo. corrected age (CA).

Methods

In 152 children born at a gestational age (GA) ≤ 32 wks. and/or with a BW of $\leq 1,500$ g, unstimulated serum cortisol was assessed at term age ($n=150$), 3 mo. and 6 mo. CA ($n=145$ and 144 resp.), and age 8y ($n=59$). Cortisol was compared between groups: (1) SGA (BW and/or length ≤ -2 SDS); (2) appropriate-for-GA (AGA) with (+) or without (-) growth restriction (GR) at 6 mo. CA; (3) SGA with (+) or without (-) catch-up growth at 6 mo. CA. Cross-sectional associations at age 8y between these groups and cortisol were analyzed using linear regression, and longitudinal associations were analyzed using generalized estimating equations.

Results

In longitudinal analyses, BW ≤ -2 SDS, SGA, AGA GR+ and SGA CUG- were associated with lower cortisol over time. Adjustment for confounders did not change this (**Table 1**). Cross-sectional analyses at age 8y did not show associations.

			Crude		Adjusted ¹			
			β	(95% CI)	P	β	(95% CI)	P
BW-SDS, continuous			17.33	(3.69; 30.96)	0.01	19.95	(4.35; 35.65)	0.01
BW-SDS, dichotomous	≤ -2 SDS	vs. > -2 SDS	-50.69	(-94.27; -7.11)	0.02	-46.70	(-97.01; 3.61)	0.07
SGA (BW and/or BL ≤ -2 SDS)	SGA	vs. AGA	-29.70	(-60.58; 1.19)	0.06	-32.55	(-66.06; 0.97)	0.06
Growth birth-6 mo. CA ²	AGA GR+	vs. AGA GR-	-55.10	(-106.02; -4.17)	0.03	-39.89	(-94.45; 14.67)	0.15
	SGA CUG-	vs. AGA GR-	-61.91	(-104.73; -19.10)	0.01	-58.67	(-105.19; -12.14)	0.01
	SGA CUG+	vs. AGA GR-	-13.26	(-49.62; 23.10)	0.48	-14.47	(-53.32; 24.38)	0.47

¹Adjusted for GA, gender and antenatal glucocorticoid treatment.

²AGA GR+/GR-, AGA with or without growth restriction (GR): weight and/or length ≤ -2 SDS or > -2 SDS at 6 mo. CA, after being born AGA
SGA CUG+/CUG-, SGA with or without catch-up growth (CUG): weight and length > -2 SDS or ≤ -2 SDS at 6 mo. CA, after being born SGA

Conclusions

In children born preterm, SGA-status and GR were associated with lower cortisol in early infancy, but not at age 8y. Whether these differences might attribute to an increased cardiometabolic risk in later life is not known.

Poster Shift 2: Neonatal & Prematurity

DETERMINING THE OPTIMAL SODIUM LOAD IN NEONATES IN THE FIRST 72 HOURS OF LIFE

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Background and Aims

There is limited data available on the sodium load required by neonates in the first few days of life. UK guidelines recommend avoiding sodium supplementation in the first 24 hours, followed by 1-3mmol/kg/day at 48-72 hours. However, most will receive sodium in drugs and line flushes, and this is unaccounted for in these calculations. We conducted a study to determine the discrepancy between administered sodium concentration and recommendations by guidelines, and describe how sodium supplementation alters serum levels.

Methods

Fifteen neonates admitted to the Neonatal Intensive Care Unit in Cambridge were included in this study. For each, the total amount of sodium administered in TPN, medications, flushes, fluid boluses and infusions over a 72 hour period was calculated. Serum sodium levels were simultaneously recorded.

Results

Across the cohort, a median of 2.85mmol/kg (range: 0.29-9.34) of sodium was administered in the first 24 hours via drugs and flushes. Over the subsequent 48 hours sodium supplementation varied between 0.52-15.57mmol/kg/day, and was always attributable to drugs and flushes, rather than intravenous fluids or TPN. Increased sodium input in the first 24 hours linearly increased serum sodium concentration at 48 hours (Pearson's correlation: 0.8, p-value: 0.005); this effect was less evident at later time points.

Conclusions

This study shows that although guidance is adhered to when prescribing maintenance fluids and TPN, significant sodium loading occurs through other administrations that are often unaccounted for. We suggest that a change in practice should occur to optimise quality of care provided to this vulnerable population.

Poster Shift 2: Neonatal & Prematurity

DOES CURRENT ESPGHAN GUIDANCE LEAD TO A CALORIE DEFICIT FOR INFANTS RECEIVING PARENTERAL NUTRITION ON THE NEONATAL UNIT?

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Background and Aims

Optimal parenteral nutrition (PN) is recognised to be important for both preterm and term infants receiving intensive care on the neonatal unit. ESPGHAN provides guidance on the amounts of protein and calories to be administered. We utilised a PN formulation based on this guidance, and audited the amount of nutrition delivered to our patient population.

Methods

We recorded the PN prescribed and delivered to 15 infants receiving intensive care on the neonatal unit over a 4 week period. We noted the amount of glucose, lipid and amino acid administered. Calorie deficits were calculated for the cohort.

Results

14 preterm, and 1 term infant receiving intensive care were selected. The amount of amino acid administered was close to the ESPGHAN guidance (figure 1). In addition, the amount of amino acid/energy administered was within guidance (1g amino acid/25 kcal/kg/day of non nitrogen energy) (figure 2). However the cumulative calorie deficit over the 1st week of life was 502 kcal/kg/day (figure 3).

Conclusions

Close adherence to current ESPGHAN guidance on parenteral nutrition administration for patients receiving intensive care may result in a moderately large calorie deficit.

Poster Shift 2: Neonatal & Prematurity

NEONATAL HYPOGLYCAEMIA AND SCHOOLING AT 8 YEARS OF AGE: A POPULATION-BASED DATA LINKAGE STUDY

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Background and Aims

The neonatal brain may be vulnerable to nutritional insults such as hypoglycaemia, which could lead to later problems with schooling. In one of the largest studies of this kind, we aimed to use population-level administrative data to explore whether neonatal hypoglycaemia was associated with poorer school achievement in grade 3 (age ~8 years).

Methods

Whole-of-population data from all births in South Australia (2001-2005) was linked to grade 3 reading, writing, grammar, spelling and numeracy domains collected from the National Assessment Program in Literacy and Numeracy. Neonatal hypoglycaemia was identified with ICD10 codes. Analyses were first conducted among the entire sample. Next, sensitivity analyses were conducted among a subset of healthier infants from which infants born preterm, low- or high-birthweight were excluded. Missing data was addressed via multiple imputation and analyses were adjusted for a large number of perinatal and sociodemographic characteristics. A negative control outcome analysis was undertaken to investigate the potential for residual confounding.

Results

Only 2% of infants had hypoglycaemia (n=504/25227). In the entire sample, hypoglycaemia was associated with slightly higher Risk Ratio (RR) of poor school outcomes (ranging from 1.07 (0.89-1.29) to 1.16 (1.02-1.31) across domains). These results were attenuated in the sample restricted to the healthiest neonates (RR ranged 0.83 (0.61-1.12) to 1.12 (0.79-1.58)). The negative control outcome analysis showed RR 1.09 (1.01-1.17) suggesting that the main analyses remained residually confounded.

Conclusions

In the South Australian setting, hospitalisation and treatment for hypoglycaemia in the neonatal period is unlikely to have lasting effects on children's school outcomes.

Poster Shift 2: Neonatal & Prematurity

FEEDING PRACTICES IN LOW BIRTH WEIGHT INFANTS

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Background and Aims

To assess the quality of feeding practices in infants aged 6 to 24 months old born with low birthweight (LBW).

Methods

It was performed a cross-sectional and control study with 37 infants (6–24 months old) born with LBW (birth weight 2.3 ± 0.3 kg and gestational age 35.8 ± 2.1 weeks, 51.3% small for gestational age). The control group was composed by 20 health infants with normal birth weight and born at term, followed in the same outpatient clinics. Data about weight, height, head circumference and gestational-age at birth were collected. We also got data on exclusive/predominant (BFE) and total breastfeeding (BFT) duration; time of solid food introduction and nourishing feeding practices through validated questionnaire of World Health Organization (WHO, “*Indicators for assessing infant and young child feeding practices*”).

Results

In LBW group the mean age was 12.3 ± 3.5 months and 54.0% were male. Infants of LBW group showed shorter BFE duration (2.6 ± 2.7 vs 4.6 ± 2.3 months; $p = 0.009$) and earlier introduction of solid foods (5.6 ± 1.4 vs 6.0 ± 0.6 , $p=0.039$) when compared to control group. There were no differences between the groups regarding WHO nourishing feeding practices. Bottle feeding started earlier in LBW group (2.4 ± 2.1 vs 4.8 ± 2.0 ; $p<0.001$).

Conclusions

The shorter duration of breastfeeding and earlier introduction of solid foods in infants born with LBW might impair the adequate growth, development and increase the risk of micronutrients deficiency and non-communicable diseases in these children who already have a higher risk for disease in short and long term.

Poster Shift 2: Neonatal & Prematurity

BIRTH ANTHROPOMETRY IN RELATION TO THE QUALITY OF GENERAL MOVEMENTS OF NON-BREASTFED LOW BIRTH WEIGHT PRETERM INFANT

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Background and Aims

Birth anthropometry, such as weight, length, and head circumference, as a marker of the intrauterine environment, has been extensively studied in relation to subsequent brain function of children in early age. The quality of general movements (GMs) is a sensitive marker of newborn brain dysfunction and a powerful method to predict developmental outcomes. The aim of this study was to investigate the correlation between the birth anthropometry and the quality of GMs of non-breastfed LBW-preterm

Methods

A prospective study was performed to a total of 62 eligible non-breastfed LBW-preterm infants. Weight, length and head circumference was measured at birth. Standardized videotaped recordings of GMs were obtained during three consecutive periods: at the age 28-36 week postmenstrual age (PMA) for preterm-GMs, at the age 38-44 week PMA for writhing-GMs, and at the age 46-52 week PMA for fidgety-GMs. Statistical analysis using correlation test, with $p < 0.05$ being considered significant

Results

The quality of preterm-GMs was significantly correlates with birth weight ($r=0.300$; $p=0.019$) and birth length ($r=0.296$; $p=0.021$), but not with head circumference at birth ($r=0.219$; $p=0.091$). However, the quality of writhing-GMs and fidgety-GMS was not significantly correlates with all of birth anthropometry parameters. With increasing age of infants, the strength of these correlations will be smaller and nonsignificant

Conclusions

The results of this study support the notion that birth anthropometry of LBW-preterm correlates with the integrity of the infant's brain, especially during the preterm period as well

Poster Shift 2: Neonatal & Prematurity

COMPARISON OF OMEGA FATTY ACIDS DAILY INTAKE IN EACH TRIMESTER DURING PREGNANCY

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Background and Aims

Long chain polyunsaturated fatty acids are responsible for fetal growth and development. Synthesis of omega-3 fatty acids is insufficient in fetus, so they depend on maternal diet. To compare the daily consumption of omega fatty acids and the ratio of n-6/n-3 for each trimester of pregnancy.

Methods

In each trimester, 130 pregnant women participated in the study. Nutritional status and the anthropometric data were obtained via a survey. Daily omega fatty acid intakes were calculated.

Results

The weight gains for 1st, 2nd and 3rd trimesters were 0.9 ± 1.2 kg, 4.5 ± 2.4 kg and 11.8 ± 10.2 kg. Daily energy, carbohydrate and protein intakes were increased significantly in 2nd and 3rd trimesters compared to 1st trimester. In each group energy and protein intakes were lower, carbohydrate intake was higher than recommended by WHO. Daily intakes of fat fluctuated; increased in 2nd and decreased in 3rd trimesters. The foods high in omega fatty acids consumed over 10 g/day for each trimester were lettuce, broccoli, parsley, spinach, chard, red lentil, green lentil, bean, sunflower oil, corn oil, olive oil, margarine, butter, almond, hazelnut, sunflower seeds, walnut, anchovy, salmon, trout. The ratios of omega-6 to omega-3 for 1st, 2nd and 3rd trimesters were 6, 11 and 10 respectively.

Conclusions

Nutritional behavior of pregnant women did not reflect the awareness of consuming omega-3 fatty acids during pregnancy, preferably at the first trimester. Education or counseling should be provided by the experts before or during pregnancy.

Poster Shift 2: Neonatal & Prematurity

SMOFLIPID® FOR PREVENTION OF PARENTERAL NUTRITION ASSOCIATED CHOLESTASIS IN ELBW INFANTS

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Background and Aims

Preterm infants with extremely low birth weight (ELBW) are at increased risk for developing parenteral nutrition-associated cholestasis (PNAC). Fat emulsions containing fish oil are used in the treatment of PNAC. Whether PNAC can be prevented by primary use of a fish oil containing fat emulsion for parenteral nutrition is little studied. We investigated to what extent a fish oil containing lipid emulsion (SMOFlipid®, SMOF) reduces the incidence of PNAC in ELBW preterm infants compared to a fat emulsion based on soybean oil (Intralipid®, IL).

Methods

In this single-center prospective, randomized, double blind study either IL or SMOF was used for parenteral nutrition in ELBW infants. The primary outcome was PNAC (conjugated bilirubin > 1.5 mg/dl in two consecutive measurements during hospital stay).

Results

A total of 230 children were included and 206 infants were analyzed (IL: n=101, SMOF: n=105). The demographic parameters were evenly distributed between the two groups. PNAC incidence was 10.5% in the SMOF group and 14.9% in the IL group, which was not statistically significant (p=0.451). There were no differences in the incidence of morbidities associated with extreme prematurity such as ROP, culture proven sepsis or NEC.

Conclusions

The use of a fish oil containing fat emulsion (SMOFlipid®) had no protective effect on PNAC incidence in ELBW infants at our center, with a generally low incidence of PNAC. Our data did not show any effect on ROP or sepsis incidence.

Poster Shift 2: Neonatal & Prematurity

FACTORS RELATED TO NUTRITIONAL STATUS AT DISCHARGE IN NEONATAL UNIT, NATIONAL GENERAL HOSPITAL DR. CIPTO MANGUNKUSUMO, INDONESIA

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Background and Aims

Background. Adequate nutrition is an important factor for optimum growth and development in children. Extrauterine growth restriction (EUGR) has to be avoided in neonatal unit at discharge.

Aims. To describe nutritional status in neonatal at discharge and its associated factors.

Methods

A cross sectional study was performed in Neonatal Unit in National General Hospital Dr. Cipto Mangunkusumo, Jakarta, Indonesia. Data was collected from medical record of discharged patients from August to October 2016. Inclusion criteria was preterm babies with gestational age (GA) 28-34 weeks. Subjects with multiple congenital abnormality were excluded and also if the medical records were incomplete. Fenton growth chart was used to monitor weight.

Results

A total of 32 subjects participated in this study. Mean GA was 32.38 ± 1.41 weeks, birth weight 1600.16 ± 300.24 g, weight increment 12.13 ± 8.14 g/kg/day. Median of length of stay 29.88 (7 – 110) days. All subjects were appropriate for gestational age. There were 6/32 subjects diagnosed as EUGR. Only 1 subject had increased weight compare to initial birth percentile, 15/32 patient stay on birth percentile, 15/32 patient decrease from birth percentile. There were no correlations between onset of initial enteral feeding, sepsis condition, days of oxygen therapy, length of stay with nutritional status at discharge ($p > 0.05$). But, time to achieve full feed was correlated with nutritional status at discharge ($p < 0.047$).

Conclusions

Although EUGR is only seen in 6/32 subjects, it is still challenging. Early full feeding has to be achieved in order to have good nutritional status at discharge.

Poster Shift 2: Neonatal & Prematurity

EARLY LIFE NUTRITION IN RELATION TO RETINOPATHY OF PREMATURITY

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Background and Aims

Low birth weight and poor postnatal weight gain are associated with retinopathy of prematurity (ROP). Malnutrition may therefore be an important factor in the development of ROP. This study assessed the relationship between postnatal growth, nutritional intake and ROP.

Methods

Actual nutritional intake during the first 6 weeks of life was calculated, and anthropometric measurements were taken weekly in 112 preterms (gestational age < 32 weeks) who were admitted to our level III NICU between 2007 and 2012.

Results

ROP was observed in 21 infants (18.8%); stage 1 in 2 infants, stage 2 in 11 and stage 3 in 8. Nutritional intake did not differ between infants with ROP and infants without ROP. Notably, minimally recommended intake for energy was not achieved in 65% of infants and growth rate was low (median 10.4 g/kg/day, IQR 8.5 - 12.1). In the first 4 weeks of life infants with ROP, compared to infants without ROP, had a lower weight, length and head circumference ($p < 0.02$), but a higher growth rate in the same period (median 12.9 g/kg/day vs 10.2 g/kg/day, $p 0.02$).

Conclusions

ROP incidence in our study population was comparable to a larger national cohort (Sorge et al. 2013); even though our study population had a low caloric intake and low growth rate. In our population nutritional intake was not associated with the occurrence of ROP. Despite a higher postnatal growth rate than infants who did not develop ROP, infants with the lowest birth weight had an increased risk of developing ROP.

Poster Shift 1: Obesity

PREVALENCE OF OVERWEIGHT AND OBESITY AMONG SCHOOLCHILDREN IN JORDAN

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Background and Aims

Marked increases in the prevalence of overweight and obesity have been observed in the last few decades in both adults and children worldwide. Obesity in childhood associated with high prevalence of elevated blood pressure, diabetes, and respiratory disease. Little data are available describing the extent of overweight and obesity among children in Jordan. It aims estimate the prevalence of overweight and obesity and determine their associated risk factors among schoolchildren in Jordan.

Methods

A descriptive cross-sectional survey was conducted on a sample of 1094 schoolchildren (571 boys and 523 females) aged 6-18 years. The sample was selected randomly using multistage stratified cluster method. Trained data collectors interviewed and measured children's weight and height. A self-reported questionnaires was completed by students' parents; data was used to analyze the factors could be associated with overweight and obesity as a risk factors. Anthroplus and SPSS were used in data analysis; Overweight and obesity were defined according to WHO reference 2007 for children 5-19 years.

Results

The prevalence of overweight was 18% (for both boys and girls) and 6.2% were obese (6.8 % for boys and 5.5 % for girls). Obesity among children of obese mothers and fathers was more prevalent. Daily and weekly whole fatty milk consumption was significantly associated with being normal weight.

Conclusions

The prevalence of overweight and obesity was in accordance with other studies conducted in Jordan. Thus, there is a critical *need for obesity-prevention programs* targeted toward children

Poster Shift 1: Obesity

EFFECT OF DIETARY *SPIRULINA PLATENSIS* ON SERUM LIPASE, PHOSPHOLIPIDS AND GLUCOSE IN RATS FED THE HIGH LIPID DIET

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Background and Aims

Antiobesity foods and food ingredients are effective in reducing the accumulation of fat in the body and can prevent diseases associated with lifestyle. One of them is *Spirulina platensis* (Spirulina), a blue green cyanobacterium. Aim of the study was to investigate whether Spirulina has the improve effects on serum lipase, phospholipids and glucose in rats fed the hydrogenated vegetable oil (HVO) and/or cholesterol.

Methods

64 male-mature rats were separated into 8 equal groups. Control group was fed a standard semi-purified diet. Supplementations of other groups fed the same semi-purified diet were as follows: Trial 1, 43% HVO; Trial 2, 10% cholesterol; Trial 3, 43% HVO + 10% cholesterol; Trial 4, 3% Spirulina; Trial 5, 43% HVO + 3% Spirulina; Trial 6, 10% cholesterol + 3% Spirulina; and Trial 7, 43% HVO + 10% cholesterol + 3% Spirulina. Bloods were taken from rats on Days 30 and 60.

Results

Serum lipase was significantly higher in Trial 6 than in other all groups on Days 30 and 60. Serum phospholipids were significantly higher in Trial 1 than in Trials 6 and 7 on Day 30 and were significantly higher in Trial 1 than in other all groups on Day 60. Serum glucose was not significantly different among all groups on Days 30 and 60.

Conclusions

Spirulina has no effect on the examined indices. Dietary HVO has increased the serum phospholipids, but the cholesterol addition beside HVO has overtaken the increase in phospholipids. Serum lipase and glucose were not affected by the dietary HVO and cholesterol.

Poster Shift 1: Obesity

PREVENTATIVE CARE MEDICINE: IDENTIFYING A LACK OF EDUCATION AS A RISK FACTOR FOR OBESITY

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Background and Aims

With the marked increase in BMI and obesity in the United States today (1), it has become difficult to recognize unhealthy weight. It is our hypothesis that parents' denial regarding their children's BMI increases as their risk for obesity increases. If we can identify a lack of education as a barrier to a healthier lifestyle, we can intervene before obesity develops.

Methods

This is a cross-sectional study that looks at the frequency with which parents believe their children are engaging in healthy habits and maintaining a healthy BMI, as compared with their actual data. A 10-question survey was created and distributed at the Fit Kids Clinic at the Riverside Medical Clinic to assess how patient and parent estimations compare with true values.

Results

This study looked at 16 patients stratified by age, gender, and BMI, and their survey responses. Of the 16 patients, 2 were over-weight and 14 were obese, categorized using the WHO BMI guidelines (25-29.9 = over-weight, >30 = obese). 9 of the 16 parents mis-classified their child as overweight when he/she was actually obese. Over half of the participants correctly identified what BMI range constitutes overweight or obese. 73% of participants under-estimated the calories in an apple.

Conclusions

Our study shows that a majority of over-weight and obese children lack self-awareness regarding their weight, normal weights, and calories in common foods. If patients could understand "normal values" and catch themselves before becoming obese, we have a strong chance of reducing the morbidity and mortality associated with obesity today.

Poster Shift 1: Obesity

EFFECTS OF DIETARY INULIN OR CHITOSAN OLIGOSACCHARIDE ON SERUM LIPID LEVELS IN RATS FED HYPERCHOLESTEROLEMIC DIET

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Background and Aims

Inulin and chitosan oligosaccharide (COS) are prebiotics. Inulin is used for its effects on immune function, bioavailability of minerals, lipid metabolism and gastrointestinal tract health. Chitosan is a natural substance produced in the body from glucose and some biological effects including anti-microbial, immune modification mechanisms. The aim of the study was to investigate the effects of inulin or COS on serum total cholesterol, HDL-cholesterol, LDL-cholesterol and triglyceride levels in female rats fed hypercholesterolemic diet.

Methods

8-weeks-old female 32 Sprague-Dawley rats were separated into four equal groups. Group 1 was fed basal diet, group 2 was fed hypercholesterolemic diet (15% hydrogenated-oil and 1.5% cholesterol), group 3 was fed hypercholesterolemic diet with 1% inulin, and group 4 was fed hypercholesterolemic diet with 1% COS. The trial period was 30 days. Serum lipids were detected by auto-analyser.

Results

Serum total cholesterol level was significantly higher in group 2 than in other all groups, and was significantly higher in group 3 than in groups 1 and 4 on day 30. Serum HDL-cholesterol level was significantly lower in group 2 than in all other groups on day 30. Serum LDL-cholesterol and triglyceride levels were significantly higher in group 2 than in other all groups on day 30.

Conclusions

While hypercholesterolemic diet significantly increased all serum lipids, COS or inulin added to the hypercholesterolemic diet reduced them to the normal levels. So, COS or inulin may be utilized in the prevention and treatment of diseases associated with life-style such as cardiovascular disease, diabetes mellitus, metabolic syndrome and obesity.

Poster Shift 1: Obesity

NO ADVERSE PROGRAMMING OF DIETARY FRUCTOSE COMPARED TO GLUCOSE POST-WEANING ON BODY WEIGHT, ADIPOSITY, GLUCOSE TOLERANCE OR METABOLIC FLEXIBILITY IN MICE

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Background and Aims

Nutrition in early life can have long-lasting consequences, as it can program metabolic health. Diets of children contain a large amount of simple sugars nowadays, and especially the monosaccharide fructose is suspected to contribute disproportionately to obesity and metabolic disorders. This study aimed to assess whether fructose, in comparison to glucose, in the post-weaning diet programs body weight, adiposity, glucose tolerance, and metabolic flexibility at adult age.

Methods

Three-week-old male (n=12) and female (n=14) C57BL/6JRcchHsd mice were placed on a low fat intervention diet with 32 energy percent glucose (GLU) or fructose (FRU) for three weeks. Afterwards, all animals were switched to a high fat diet (HFD) for nine weeks.

Results

Body weight and fat mass, as determined by EchoMRI, did not differ between GLU and FRU groups. Also after the switch to HFD, body weight and fat mass were not different between GLU and FRU groups. Glucose tolerance, assessed with an oral glucose tolerance test in week 11, and metabolic flexibility, studied with an fasting-refeeding challenge in week 14, were not altered by the post-weaning diet. Serum insulin levels in FRU fed females were significantly lower in week 15 than in GLU fed females, yet in males no effect was found. Liver triglyceride levels were not affected by the post-weaning diet in either sex.

Conclusions

Concluding, there was no adverse programming of dietary fructose in the post-weaning diet in comparison to glucose on body weight, adiposity, glucose tolerance, and metabolic flexibility; insulin sensitivity was increased by fructose in post-weaning diet in females.

Poster Shift 1: Obesity

BODY MASS INDEX DETERMINES GUT MICROBIAL METABOLISM INDEPENDENTLY OF DIET-INDUCED SHIFTS IN COMMUNITY STRUCTURE

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Background and Aims

The gut microbiota and its metabolic performance contribute to obesity and its progression towards metabolic disease. Thus, modulation of gut microbiota by diet has been proposed for the management of obesity.

Methods

Here, we measured the impact of 1-year controlled calorie restriction nutritional program on metabolic performance (α -glucosidase and β -galactosidase activities) and microbial community structure of total and fluorescently labeled β -galactosidase sorted microbes in faecal samples of eight lean and thirteen obese adolescents. 16S rRNA gene sequencing was used to characterize microbial community composition.

Results

Dietary intervention reduced mean calorie intake and significantly improved body mass index (BMI) and insulin resistance in obese adolescents. Interestingly, microbial metabolic performance positively correlated with BMI, plasma LDL, insulin levels, and HOMA-IR index. Significant changes in gut microbiota composition in obese adolescents were only achieved after 1-year of calorie restriction (CR) that resulted highly similar to the composition in lean adolescents. These changes were related to a significant reduction in the *Firmicutes:Bacteroidetes* ratio and an enrichment in members of *Bacteroides*, *Roseburia*, *Faecalibacterium* and *Clostridium* XIVa. Despite CR matched microbial compositions, metabolic performance was still significantly higher in obese, split in two metabolic states at a BMI value of 25.

Conclusions

Calorie restriction is a strong environmental force reshaping gut microbial community structure though its metabolic performance is regulated by host's adiposity. Our results suggest that shifting the composition of gut microbiota to a healthy state may not be enough to reduce their metabolic contribution to obesity development.

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Poster Shift 1: Obesity

INTENTION OF WEIGHT CONTROL BEHAVIOR AND ITS RELATED FACTORS AMONG COLLEGE STUDENTS

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Background and Aims

Obesity and overweight are the popular phenomenon in the world. WHO considers the obesity is a factor raising risk of diabetes, cardiovascular diseases and cancers. The body weight can be adjusted by diet and exercise to maintain healthy and good body shape. The purpose of this study is to realize college students' intention of controlling body weight and possible related factors.

Methods

380 students, as subjects, of day division in three universities of technology in Taiwan were sampled by quota sampling and tested by self-designed questionnaire. Then, descriptive and inferential statistics were analyzed using SPSS for windows 17.0.

Results

The investigation revealed that approximately 70% students lack of understanding of healthy BMI range and appropriate food categories while losing weight. Regarding the attitude of controlling weight was positive; however, the intention of behavior to control weight by exercising was medium and by diet was less. Besides, subjects, who is aware of overweighting of him/herself, had significantly less weight control behavior by diet and exercising. Subjects, who has familial hereditary obesity, had obviously negative attitude and behavior of controlling weight. Moreover, the significant relationships of controlling weight had been showed between knowledge and attitude, attitude and dietary behavior intention, attitude and exercising behavior intention as well as dietary and exercising intention of behavior.

Conclusions

Conclusively, the study recommended that students may build up the knowledge about relationship between diet and losing weight as well as the habit of regular exercise and balanced diet via peer influence to control weight sufficiently and away from diseases.

Poster Shift 1: Obesity

PREVALENCE OF OBESOGENIC RISK FACTORS AMONG INFANTS AND YOUNG CHILDREN IN GREECE

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Background and Aims

Previous research has identified modifiable risk factors associated with childhood weight status that begin during infant and toddler ages. The aims of this study were to assess obesogenic risk factor prevalence within a region known to have one of the highest rates of childhood overweight and obesity in the world.

Methods

Within 4 regions in Greece, 501 mothers of children from birth–4 years of age were interviewed. Previously validated questions designed to assess breastfeeding, diet, and obesity risk related behaviors (sleep duration, TV/active play time, family meals, and parental responsive feeding practices) were included.

Results

Initiation of breastfeeding was high (81%), with average duration of 23 weeks. From 6–11 months, infants consumed a fruit nearly every day, but a vegetable only 4 times per week. At 12 months, children consumed approximately as many servings each week of sweetened juice, sweets, ice cream or chips as they did of vegetables. Many infants (60%) had a consistent bedtime routine, yet only 36% of infants and toddlers slept for more than 9 hours at night. TV and screen time viewing averaged 2h 45 minutes/day for older toddlers. Families ate the dinner meal together <4 times per week and maternal reported 'pressuring feeding style' was >50%.

Conclusions

Obesogenic risk factors were identified with high frequency within infants and young children in this Greece sample. Results identify opportunities for early nutrition education interventions to address diet and other modifiable parental feeding and related factors associated with childhood obesity.

Poster Shift 1: Obesity

FAT MASS PERCENTAGE AT THE AGE OF 6 MONTHS; PEA POD VERSUS DXA-SCAN

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Background and Aims

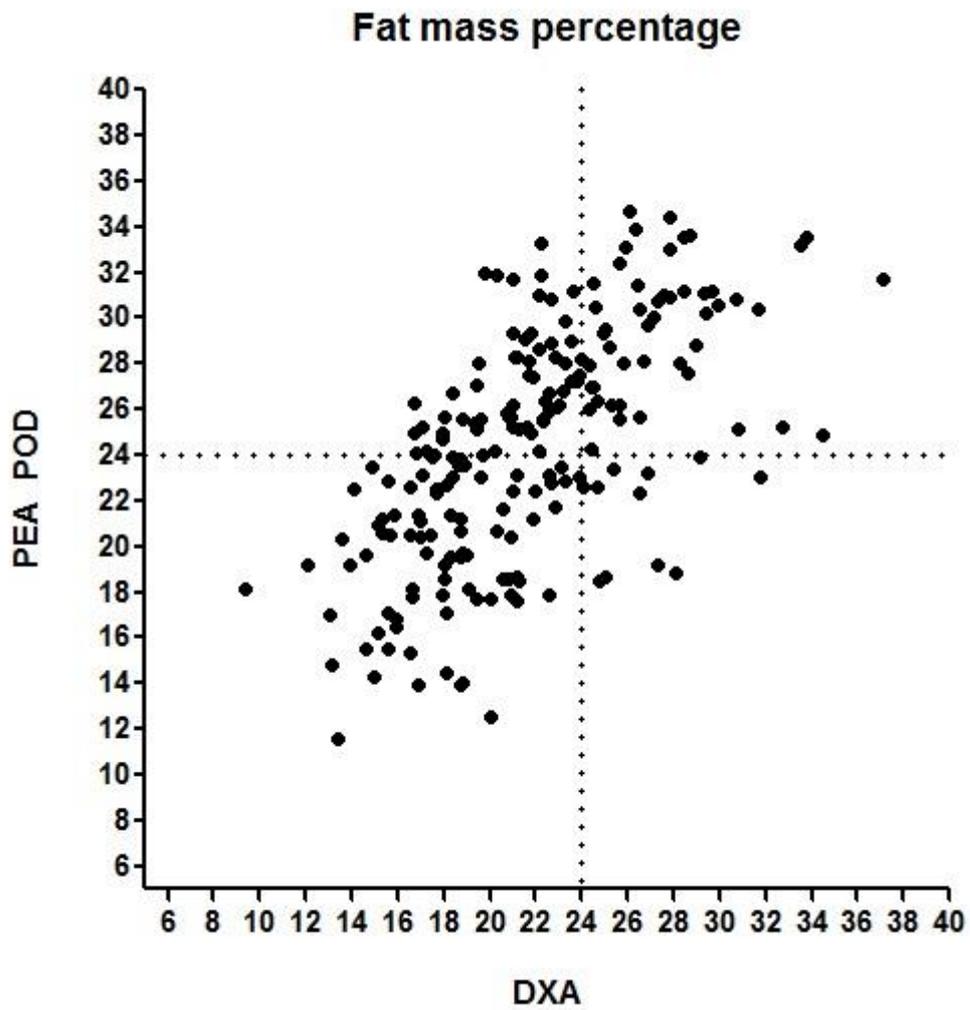
Up until now air displacement plethysmography (PEA POD) is the gold standard for determining fat mass percentage (FM%) in newborns until 6 months of age. From 4 years of age, Dual energy X-ray absorptiometry (DXA) is the gold standard. The aim of this study was to compare different techniques for measuring FM% at the age of 6 months.

Methods

In 203 infants (109 males), aged 6 months, FM% was determined by PEA POD (COSMED, Italy) and DXA (Lunar Prodigy, GE Healthcare, UK). During DXA, a vacuum cushion (465 75100, Schmidt, Germany) was used to prevent movement. DXA scans were analyzed using Encore software version 14.10.

Results

Mean (SD) FM% at age 6 months was 24.4 (5.1) and 21.6 (4.8) by PEA POD and DXA, resp. ($p < 0.001$), a difference of 2.8% between the two methods. There was a wide variation in FM% by both PEAPOD and DXA. FM% by PEA POD was positively correlated with FM% by DXA ($r=0.64$, $p < 0.001$). FM% was similar between PEA POD and DXA when FM% was below 24 measured by PEA POD (Figure).



Conclusions

This study shows a large variation in FM% in infants at the age of 6 months. PEA POD shows a higher FM% of 2.8 compared to DXA.

Poster Shift 1: Obesity

THE IMPACT OF EXCESS BODY WEIGHT ON BONE REMODELING IN ADOLESCENTS

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Background and Aims

The aim of this study was to investigate the impact of excess body fat on bone remodeling in adolescents.

Methods:

Body weight, height and BMI were determined in 391 adolescents (normal weight, overweight, obese, and extremely obese). Bone age was obtained and bone mineral content /density were evaluated in the lumbar spine, proximal femur, and total and subtotal body. Blood samples were collected for evaluation of bone biomarkers: osteocalcin, bone alkaline phosphatase (BAP), and serum carboxy-terminal telopeptide (S-CTx). The data were analyzed according to nutritional status and age.

Results

In girls with excess weight, the biomarkers were higher in the 10 to 13-year age group and no significant differences were observed between groups according to nutritional status. In boys, the levels were higher in those aged 13 to 15 years. According to nutritional status, significant differences were only observed in mean S-CTx for the age groups of 10-15 years, with higher levels between overweight and obese adolescents aged 10-12 years and between obese and extremely obese adolescents aged 13-15 years. In girls, significant negative correlations were observed between fat mass and fat percentage and each of the three bone markers studied. There was no correlation between fat mass and the three biomarkers in boys. The biomarker trends demonstrated across the age groups follow the age trends for growth velocity.

Conclusions:

The higher the fat percentage and fat mass in girls, the lower the levels of the biomarkers, indicating that excess body fat has a negative effect on the evolution of these markers during adolescence.

Poster Shift 1: Obesity

METABOLIC SYNDROME AND CARDIOVASCULAR RISK FACTORS IN ALGERIAN OBESE CHILDREN AND ADOLESCENT

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Background and Aims

Background: Obesity prevalence in Algeria is 18% (IOTF) This is a real disease associated with many comorbidities Objective To investigate the prevalence of different components of the metabolic syndrome (MetS) and risk factors among a representative sample of obese children and adolescents in our nutrition pediatric unit

Methods

Methods The study sample was representative of the Algerian obese children and adolescents aged from 5 to 16 years followed in our nutrition pediatric unit The prevalence of different components of MetS was assessed. Anthropometry BMI (OMS 2007) and waist circumference (MacCarthy 2001), WC/H ratio; blood pressure (OMS) and serum-fasting triglycerides, total cholesterol, HDL and LDL cholesterol, glucose and insulin were performed The subjects in our study were diagnosed with metabolic syndrome (IDF 2007) if they had a waist circumference above the 90th percentile (MacCarthy 2001), and two or more of the IDF 2007 criteria

Results

Results The study participants consisted of 135 children and adolescents (59% girls) with mean age of 11 years; 90% were obese 51% had a severe obesity ≥ 4 ZS. 78% with acanthosis nigricans correlated with hyperinsulinemia in 40% of them. The prevalence of metabolic syndrome was 35%. 95% of participants had at least one risk factor with WC/H ratio $> 0,5$. The most prevalent risk factors: abdominal obesity in 100%, low HDLc in 45% and elevated triglycerides levels in 47%

Conclusions

Conclusion The findings from this study provide alarming evidence-based data on the considerable prevalence of obesity Met S, and CVD risk factors in our patients, earlier intervention is needed

Poster Shift 1: Obesity

RAMADHAN FASTING REDUCES ANTHROPOMETRI PARAMETERS YET NOT SHOWING METABOLIC MARKER IMPROVMENT IN OVERWEIGHT ADULTS MALES

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Background and Aims

One of obesity interventions is negative energy balance. Moslem Ramadan Fasting could be an expected effort to create a negative energy balance. This study aims to see the changes in anthropometric parameters (body weight, % fat mass, waist-hip ratio-WHR) and metabolic parameters (plasma lipid, inflammation marker), and the relationship among the parameter changes with total energy intake in overweight adults who are fasting Ramadan.

Methods

Differences in anthropometric data in 32 male respondents aged 18-30 years in Malang taken by purposive sampling technique were analyzed using Independent t Test, while correlation of anthropometric data and metabolic parameters on food intake was using Spearman test.

Results

All anthropometric data significantly decreased, but total cholesterol (TC) plasma levels and low density lipoprotein increased. Plasma triacylglycerol (TG) and high density lipoprotein changed insignificantly. TNF alpha remained same, but IL-6 increased after the fasting. Significant decrease of total intake of energy, protein, fat, and carbohydrates by 16%, 14%, 30% and 20% respectively related to changes in BW, % fat mass, visceral fat, and WHR. Total energy intake and fat with increasing TG levels correlated significantly. Metabolic markers showed no improvement. Elevated TC levels were caused by excess fat reserve breakdown to meet energy needs and food nutrient proportion containing > 35% fat. Inflammatory markers improved insignificantly that was likely caused by respondents' category of not severely obese.

Conclusions

Continuous negative energy balance for 25 days can quickly degrade anthropometric parameters but increase plasma TC because of lipolysis presence as a homeostatic mechanism.

Poster Shift 1: Obesity

PLASMA LEVELS OF ACYLATED GHRELIN (AG) AND GLUCAGON-LIKE PEPTIDE-1 (GLP-1) IN OBESE AND NON-OBESE SUBJECTS FOLLOWING FAST FOOD CONSUMPTION

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Background and Aims

High energy density of fast food is considered as a trigger of obesity process. Levels of anorexigenic Glucagon-Like Peptide-1 (GLP-1) and orexigenic Acylated Ghrelin (AG) hormone releases can portray satiety response and reference the appropriate food selection for obesity intervention. AG will increase in obese people whereas GLP-1 shows the opposite. This study aims to examine the response of both gut hormones in obese and non-obese who consume fast food.

Methods

Venous blood for plasma AG and GLP-1 from 16 obese and 16 non-obese were collected after consuming time 0, 30, 60, and 120 minutes of a test meal of fast food (500-600 kcal). The data were analyzed using unpaired t-test and Mann Whitney-U test.

Results

The results revealed the levels of AG and GLP-1 in obese were significantly higher than in the lean man in all-time series. The total area under curve (AUC) for AG and GLP-1 were significantly higher in obese than in lean man ($p < 0.000$, $p = 0.002$ respectively)

Conclusions

Plasma AG and GLP-1 are higher in obese than non-obese man. GLP-1 increases may be due to the stage of not yet reaching glucose intolerance in obese samples, the respondent ages which were below 25 years old, and the inability of this study to identify active GLP-1 levels, thus the functional degree of total GLP-1 in each group cannot be identified. The possibility of abnormalities in the gut hormonal systems that may contribute to the development of obesity need further investigation.

Poster Shift 1: Obesity

ASSOCIATION OF NUMBER OF SIBLINGS AND LIPID PROFILE AMONG OBESE AND NON-OBESE SCHOOL CHILDREN IN BANDAR LAMPUNG INDONESIA

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Background and Aims

To study the association between number of siblings and incidence of childhood obesity and dyslipidemia among school children in Bandar Lampung Indonesia.

Methods

A cross sectional study has been conducted among 392 school children (195 Male and 197 Female) of fourth grade from five elementary schools in Bandar Lampung. Anthropometric, demographic and diet pattern was measured by standard methods. Z-score was used to categorize of BMI of the children into two obese and non-obese. Blood was drawn to determine triglycerides (TG), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C) and total cholesterol (TC) plasma, and then the atherogenic index plasma (AIP) was calculated.

Results

Of 392 students involved in the study, 15.9% was with no sibling (S) , 38.7% with one sibling (D) and 45.5% had more than one siblings (T). The highest prevalence of obesity was found in S (40%), followed by T (27.5%) and the lowest was occurred in D (18.5%). Median of S's BMI was 18.0 kg/m², higher than those of D's BMI (16.3 kg/m²) or T's BMI (17.2 kg/m²). The prevalence of hyper-LDL-C (>110 mg/dl) was found in 20.0% of S, 13.7% of D and 9.4% of T. TG concentration of S and T were similar (21.7 and 21.6 mg/dl, respectively), but these levels were higher than those of D (15.7 mg/dl). Percentage of student who had high risk of atherosclerosis (AIP>0.22) in S and T were higher than those of D (53.3, 54.4 and 46.6, respectively).

Conclusions

Having two children has beneficial effect on children's health outcomes

Poster Shift 2: Obesity

SMALL FOR GESTATIONAL AGE - POTENTIAL RISK FACTOR FOR ASSOCIATED CONDITIONS

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Background and Aims

Children born small for gestational age (SGA) might had influence in prevalence, clinical features and outcome of associated conditions which lead to chronic diseases in adulthood. A cohort of 100 children born SGA was evaluated for associated obesity. An analyzed data was taken during patient's first visit in the study.

Methods

Clinical birth and anthropometric data were investigated in SGA children with increased body weight. Auxology parameters were estimated with precise equipment specialized for pediatric population. A biochemical analyses were used to confirm condition and evaluated pancreatic function.

Results

We revealed 4 (4%) obese SGA born children who caught grown up (+1.05 SDS) by the 4th year. Their birth parameters were low for the gestational age, mean BW (-1.9 SDS) and BL (-1.8 SDS). Mean weight of these three girls and one boy was 63.20kg (2.65 SDS), and respectively body mass index was above 98th percentile, mean 27.0 kg/m² (2.60 SDS), for their age and sex. Value of Homeostasis Model Assessment - Insulin Resistance (HOMA-IR) index in all 4 children was within abnormal range, 1.26-2.65. Two teenagers had significant hyperinsulinemia and underwent treatment with metformin. Other two girls needed only dietary regiment and increased physical activities.

Conclusions

We presented 4 obese children born small for gestational age from Macedonia. This condition is potential risk factor for cardiovascular diseases and diabetes mellitus in adulthood.

Poster Shift 2: Obesity

EFFECT OF MIX OF COCOA AND *UNDARIA PINNATIFIDA* ON OBESITY GENE MARKERS IN A MURINE MODEL

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Background and Aims

In the last decades, several compounds from vegetal sources have been studied and have proven to be beneficial for human health, specially fo obesity, due to its anti-inflammatory and antioxidant properties. Cocoa powder and brown algae, *Undaria pinnatifida* are two ingredients that have been studied because to their flavanol, carotenoid and fiber content. The objective of this work was to evaluate the effect of the administration of cocoa, *Undaria pinnatifida*, and their mixture in gene markers in a model of obesity induced by diet.

Methods

The effect of these foods and its components on weight gain and adipose tissue accumulation, blood pressure, insulin resistance, glucose, triglycerides and cholesterol levels, as well as inflammation markers (adiponectin, leptin, C-reactive protein and PAI-1) was evaluated using Wistar rats, distributed in 5 study groups (n=6). The study groups were: 1) Standard diet group (STD); 2) High fat diet group (AG); 3) High fat diet+cocoa powder (CO); 4) High fat diet+ *Undaria pinnatifida* (UP); 5) High fat diet + mixture cocoa:algae (MZC).

Results

After 8 weeks, rats from cocoa, algae and mixture groups showed an improvement with respect to the expression of genes related to inflammation (leptin, adiponectin, IL6), fatty acid oxidation and lipid metabolism (PPARg, PPARa, PGC1-a, UCP-1 and ACC). Additionally the cocoa, alga, and mixture treatments proved to favor adipogenesis as well as adipocyte differentiation by over expressing PPARg.

Conclusions

The compounds studied on this work proved to be a potential solution for treating fat accumulation and the commorbidities associated to this condition.

Poster Shift 2: Obesity

EFFECT OF COCOA FLAVANOLS ON THE GENE EXPRESSION INVOLVED IN INFLAMMATION IN OBESITY

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Background and Aims

It has been observed that cocoa flavanols reduced weight gain and fat accumulation by reducing intestinal absorption of lipids, increase insulin sensitivity and reduce oxidative stress and inflammation associated with obesity.

The aim of this study was to determine the role of cocoa flavanols on the gene expression involved in the regulation of lipid metabolism and inflammation.

Methods

Male Wistar rats distributed into 7 different groups (N = 7 per group) were used: (-) control standard diet ad libitum untreated (SD); Control (+), high-calorie diet ad libitum untreated (HCD); cocoa (1 g / kg bw) + HCD (Co); cocoa extract (100 mg / kg bw) + HCD (Co-Ex); epicatechin (10 mg / kg bw) + HCD (Epi); catechin (10 mg / kg bw) + HCD (Ca); and procyanidin B2 (10 mg / kg bw) + HCD (PB2). At the end of the experimental period (week 8), liver, and adipose tissue depots were removed and weighed.

Results

Groups Co and Co-Ex showed significant hyperleptinemia decrease by reducing levels of leptin gene and protein expression. Decreased accumulation adipose tissue relates to decreased levels of TNF- α and IL-6 expression.

The adiponectin increased levels in all groups treatment suggests that it exerts antiinflammatory effects in adipose tissue, by decreasing levels of proinflammatory cytokines.

Conclusions

Whereas APN is involved in the regulation of insulin sensitivity and fatty acid oxidation, our results suggest that increased levels in the groups Co and Co-Ex may favor the reduction fat mass by increasing fatty acid oxidation in adipose tissue .

Poster Shift 2: Obesity

COMBINING BIOIMPEDANCE AND SERUM LEPTIN LEVELS TO PREDICT BODY COMPOSITION IN CHILDREN

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Background and Aims

Our aim was to assess the validity of combining bioimpedance (BIA) and leptin to predict body composition in children when compared to deuterium oxide dilution (D₂O).

Methods

Total body water (TBW) [kg] was assessed using BIA and D₂O in sixty 8 year-old children. Fat mass (FM) [kg] and lean body mass (LBM) [kg] were obtained from the BIA device algorithms; LBM was also predicted from BIA and D₂O by applying the Lohman hydration factors of LBM, and FM was calculated as the difference to body weight. Serum leptin [ng/ml] was measured from a fasted sample, and prediction models were obtained from linear regressions for TBW, FM and LBM by combining leptin and BIA TBW (adjusted by gender and BMI).

Results

TBW assessed by the BIA device differed 5.1% from D₂O; difference was 2.2% when leptin was added to BIA TBW in the prediction model (Figure 1). Using leptin in prediction models with BIA TBW and applying hydration factors of the LBM reduced the difference to D₂O assessments from 9.3% to 2.2% for the LBM (Figure 2) and from 23.2% to 5.6% for the FM (Figure 3).

Conclusions

Combining BIA TBW measures with leptin and considering the specific hydration factors of the LBM for age and gender may be a valid feasible method to assess body composition in children.

Poster Shift 2: Obesity

CLINICAL AND METABOLIC EFFICACY OF THE MOTIVATIONAL APPROACH, COORDINATED BETWEEN PRIMARY CARE AND THE CLINICAL HEALTH SERVICES FOR CHILDHOOD OBESITY TREATMENT: CLUSTERED RANDOMIZED CLINICAL TRIAL

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Background and Aims

This study aims: First, to assess the efficacy of a motivational therapy, coordinated between hospitals and primary care centers (PCC) on families with an 8-13 years old obese child. Second, to validate techniques to assess body composition in obese children and adolescents.

Methods

Clustered randomized clinical trial, with an intervention group that will receive a multicomponent motivational and educational plan which will be compared to a control group receiving the usual recommendations performed at PCC (n=334, 167 per group). The intervention will consist of: 11 structured visits (performed at the PCC), which will lead to specific objectives, signed compromises and promote home activities; 3 group workshops; providing children with a wearable wrist band which monitor steps. Length of the intervention: 12 months. Both groups will be assessed at the hospitals before and after the treatment takes place on: anthropometry, bioimpedance, deuterium oxide dilution (D₂O)), air displacement plethysmography (Bod-Pod) and Dual X-Ray Absorptiometry (DXA). Outcomes: Changes in BMI z-score between the first visit and 12 months. As well as changes in waist circumference and body composition (fat mass index and lean mass index (DXA, Bod-Pod and D₂O)).

Results

Sixty-four therapists from 10 PCC were recruited and attended to a training course; currently the study is ongoing; in 4.5 months 105 (64 intervention) obese children have been recruited, assessed at hospitals and have started the treatment at PCC. There are not withdrawals yet.

Conclusions

The study may be able to show results from 2019 onwards.

Poster Shift 2: Obesity

THE BIOIMPEDANCE ANALYSIS IN THE PROGRAM OF BODY WEIGHT CORRECTION IN CHILDREN WITH OVERWEIGHT AND OBESITY

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Background and Aims

Based on the modern evidence, 5.5–11.8% of children in the Russian Federation are overweight and about 5.5% have obesity. The aim of this study was to evaluate the effectiveness of using the bioimpedance analysis of body composition to optimize recommendation for diet correction.

Methods

74 children aged 6–18 years with overweight or obesity have been examined. The component body composition was studied using bioimpedance analysis. The assessment of nutrients intake was made using the 3 days-questionnaire method and a computer program for calculation of the diet chemical composition.

Results

16 children (21.6%) were overweight, 31 children (41.8%) had 1st degree obesity, 27 children (36.4%) had 2nd degree obesity ($p < 0.05$). According to the bioimpedance analysis, water retention in the organism was revealed in 44 girls (59.5%) and 30 boys (40.5%). The active cell mass (ACM) was more often reduced in children with 1st–2nd degree obesity – in 79.31%, as compared to children with overweight – 62.5%. After the carried-out diet (observance of food and water intake schedule, elimination of appetite-stimulating products, use of fasting days) as well as additional measures (increase in physical activity, change of eating behavior, keeping a food diary), in 51 children (68.9%), the body composition measurements had positive dynamics: fat mass and BMI decrease, ACM, specific basal metabolism and phase angle increase. In 18 patients (24.3%) who did not keep recommendations, the bioimpedance analysis indices remained unchanged.

Conclusions

The bioimpedance analysis benefits in evaluation of the diet therapy effectiveness.

Poster Shift 2: Obesity

FOOD CONSUMPTION AT MID-AFTERNOON SNACK OCCASIONS AMONG SPANISH CHILDREN

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Background and Aims

There are increasing concerns about the types of foods and beverages consumed during snack meal occasions, particularly in relation with childhood obesity. The purpose of this study is to describe the frequency and quality of the mid-afternoon snack in a representative sample of Spanish children.

Methods

2841 children aged 3 to 12 participated in the study. Food and beverages consumed per week during mid-afternoon snack occasions were described by an online platform. Chi-square tests were performed to study differences between gender.

Results

82.7% of boys and 89.6% of girls aged 3 to 6 and 79.6% of boys and 76.8% of girls aged 7 to 12 were mid-afternoon snack consumers. Savoury and sweet sandwiches followed by fruits, were the main food items consumed. A lower proportion of girls consumed milk and juices and a higher proportion of girls consumed dairy desserts compared with boys aged 3 to 6 ($p < 0.05$). A lower proportion of girls consumed savoury and sweet sandwiches, fruits, chocolates and savoury snacks and a higher proportion of girls consumed milk, compared with boys aged 7 to 12 ($p < 0.05$). Milk and cookies and fruits and yogurt were the top 2 combinations among children aged 3 to 6 and 7 to 12.

Conclusions

Food consumption at mid-afternoon snack occasions decreases with age. Public health recommendations should focus on promoting healthy food consumption at mid-afternoon snack occasions in children.

Poster Shift 2: Obesity

THE STUDY OF THE RELATIONSHIP OF POLYMORPHISMS OF GENES ASSOCIATED WITH NUTRITION-RELATED DISEASES WITH THE LEVEL OF HORMONES IN BREAST MILK OF WOMEN IN ASTRAKHAN

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Background and Aims

It was shown that the increased level of hormones regulating energy homeostasis in breast milk correlates with infants' high growth rate - a risk factor of obesity. However the reason of hormones increase in breast milk is not clear. The aim of the study was to evaluate the association of some single nucleotide polymorphisms - rs9939609 of FTO, rs4994 of the β 3 adrenoreceptor (ADRB3) and C667T methylenetetrahydrofolatereductase (MTHFR) genes with the hormones level in breast milk.

Methods

The study was performed in 76 women at Astrakhan maternity hospital. All participants gave their informed consent. The levels of leptin, ghrelin, adiponectin and IGF-1 were determined in colostrum by ELISA. Genetic polymorphisms of genes were studied by real time polymerase chain reaction.

Results

When one mutant allele is in the FTO, MTHFR and ADRB3 genes there is a tendency to increase of ghrelin level in the breast milk of women. The difference in the level of ghrelin is significant only at CT genotype of C667T polymorphism of MTHFR gene (1.37 ± 0.32 and 0.65 ± 0.06 ng/ml, for CT and CC genotypes respectively, $p=0.045$). There was also a tendency for increase of the leptin level in breast milk at this polymorphism of the MTHFR gene (0.32 ± 0.03 and 0.26 ± 0.01 ng/ml for CT and CC genotypes respectively, $p=0.056$).

Conclusions

Genetic polymorphism of the MTHFR gene possibly influence the level of ghrelin in breast milk. The influence of this association on the risk of future obesity in infants and its mechanism needs in further investigation.

Poster Shift 2: Obesity

A NUTRIENT CONTENT ANALYSIS OF RECIPES PREPARED IN POPULAR COOKING TELEVISION SHOWS THAT TARGET CHILDREN

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Background and Aims

To analyse the nutritional content of recipes prepared in children's reality television cooking shows, and compare them against the World Health Organization recommendations

Methods

A cross sectional analysis of 150 recipes was carried out. The recipes' content of energy, total fat, saturated fatty acids, total carbohydrates, sugars, fibre, protein, salt, and vitamin D was analysed

Results

The recipes accounted for 27% (18-38) of the 2000kcal reference intake (RI) and did not deviate significantly from the recommendation, $z=-1.198$ $p=.2$. The recipes were high in fat 41% (28-56) and significantly deviated from the recommendation $z=-1.798$, $p=.003$. The median proportion of energy derived from saturated fatty acids 13% (8-21) and significantly deviated from the recommendation ($\chi^2=9.394$ $p=.005$). The recipes were low in total carbohydrates and fibres, 36% (18-50) $z=-2.878$ $p=.002$ and 2% (1-3), $z=-2.205$ $p=.01$, respectively. The median proportion of energy derived from sugars was 9% (3-23) and not significantly different to the recommendation $z=-.636$, $p=.2$. The median proportion of energy derived from protein was 17% (9-25) and did not deviate significantly from recommendation $z=-.692$, $p=.25$. The median salt content was 1.3g (0.5-2) and within the recommendation $z=-1.545$, $p=.06$. The median vitamin D content per recipe was 1.2 μ g (0-1.3) and did not deviate significantly from the recommendation $z=6.212$, $p=.1$. The content of each nutrient varied among recipe categories except for total fat ($\chi^2=2.918$ $p=.57$) and vitamin D ($\chi^2=6.21$, $p=.1$).

Conclusions

The recipes fell short of the WHO recommendations for total fat, saturated fatty acids, carbohydrates and fibres.

Poster Shift 2: Obesity

WATCHING COOKING TELEVISION SHOWS INDUCES HUNGER AND CRAVINGS IN ADOLESCENTS

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Background and Aims

To investigate the effect of watching a TV cooking shows on hunger, cravings and immediate food preference in adolescents.

Methods

A pretest-post test experimental study design involving 69 participants that were randomly assigned into 2 experimental groups and one control group. The two experimental groups watched 8 minute long segments of an educational and an entertainment cooking TV show while the control group watched a non-food related show. Hunger, cravings and food preference were measured before and after exposure to the different TV shows.

Results

Hunger significantly increased after watching the educational TV cooking ($z=-2.18$ $P=.003$). The difference in hunger was not statistically significant in the second experimental group and in the control group $z= 1.86$ $p=.06$ and $z=.58$ $p=.5$, respectively. In the group that watched the educational cooking television show 52% of the children changed what they craved to what was prepared on the show, which is significantly more ($X^2=14.605$, $p=.001$) compared to 23% of the children that watched entertainment cooking show and no changes in the control group. Lastly, there was no statistically significant difference in immediate food preference between watching a segment of an educational or an entertainment cooking television show $F(2,68)=.01$, $p=.91$

Conclusions

Watching a segment of an educational TV cooking show significantly increases hunger and leads to craving the foods prepared in the show. Entertainment TV cooking shows elicit a similar effect but to a lesser extent. Such an effect, and both TV show formats have no effect on immediate food preference

Poster Shift 2: Obesity

MANAGEMENT OF HYPERURICEMIA IN PREPUBERTAL CHILDREN (TANNER STAGE 1): IS THERE A ROLE FOR FUNCTIONAL FIBERS?

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Background and Aims

Although uric acid was first identified some two centuries ago, newer pathophysiologic aspects of hyperuricemia continue to emerge. For years, hyperuricemia has been thought to be exclusively associated with gout, but it has now been associated with a number of metabolic and hemodynamic abnormalities in adults.

Methods

We have examined association between hyperuricemia and components of metabolic syndrome (dyslipidemia, obesity, insulin resistance, and elevated blood pressure) in pre-pubertal (Tanner Stage 1; Age 6-9 years) obese school children from underserved population of Nuevo León, Mexico.

Results

Compared to normal weight children, children in the obese group had significantly greater waist circumference, higher systolic and diastolic blood pressure, elevated fasting insulin and insulin resistance (IR), higher triglycerides, higher serum uric acid (sUA), and lower HDL-cholesterol. Among the obese children, 33% had characteristics of MetS and 57% of these children had sUA between 5.1-7.1 mg/dl. sUA was positively associated with IR and dyslipidemia.

Conclusions

We have established a clear association between hyperuricemia and components of metabolic syndrome in prepubertal children for the first time. However, we cannot be certain whether hyperuricemia is the cause or effect of obesity. If hyperuricemia were the cause, its management in young children will be problematic since pharmacologic agents used to treat the condition are largely for adults with plethora of side effects and no experience with their use in children. Therefore, I would like to summarize available data explore the possibility of managing hyperuricemia in children with functional fibers.

Poster Shift 2: Obesity

ASSOCIATION OF SOCIOECONOMIC STATUS AND PREVALENCE OF OVERWEIGHT /OBESITY AMONG CHILDREN AND ADOLESCENTS - INTERVENTION STUDY WITH YOUNG PEOPLE WITH NEET STATUS IN AUSTRIA

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Background and Aims

Most studies conducted in developed Western countries observed an inverse relationship between socioeconomic status (SES) and overweight /obesity in children and adolescents. Young people with NEET status (not in education, employment or training) are particularly socially disadvantaged, which favours unhealthy behaviour. About 8.7% of Austrians youth have NEET status. In order to gain knowledge on this group's health behaviour and body weight and to improve their health literacy, the GAAS project was performed.

Methods

53 participants (32 male, 21 female, aged 17.9 ± 1.7 years) were recruited. To determine SES and dietary habits a questionnaire was designed. Body composition was measured using bioelectrical impedance analysis. Body weight was classified on the basis of BMI using cut-off points recommended by Kromeyer-Hauschild et al. (2015).

Results

70% of participants had a low/medium SES. Mean BMI was 25.0 ± 5.1 kg/m². 66.7% of the young adults were normal weight, 12.5% overweight, and 20.8% obese. Compared to Austrian secondary school children (6% overweight, 3% obese), to apprentices (16% overweight, 10% obese) as well as to results of the HBSC study (12.4% overweight and obese) the prevalence of overweight and obesity was higher in young people with NEET status. Average body fat percentage was $14.6 \pm 7.3\%$ in male and $33.4 \pm 8.1\%$ in female. Every second participant had too high body fat percentage.

Conclusions

Low SES results in high prevalence of overweight/obesity, which underlines the necessity of specific public health activities. The GAAS project yields to improve healthy behaviour among young people with NEET status to prevent adverse effects of excess body weight.

Poster Shift 2: Obesity

OBESITY IN PATIENTS WITH ACUTE LYMPHOBLASTIC LEUKEMIA IN CHILDHOOD

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Background and Aims

Acute lymphoblastic leukemia (ALL) is the most common childhood malignancy, affecting approximately 1- 4.75 per 100.000 people worldwide, with a peak age of occurrence between 2 and 6 years .The aim was to determine the race and age compared to the rest of the world

Methods

Acute lymphoblastic leukemia is the most common malignancy in childhood of Uganda. Continuous progress in risk-adapted treatment for childhood acute lymphoblastic leukemia has secured 4-year event-free survival rates of approximately 80% and 8-year survival rates approaching 90%. Almost 75% of survivors, however, have a chronic health condition negatively impacting on cardiovascular morbidity and mortality. Obesity can be considered one of the most important health chronic conditions in the general population, with an increasing incidence in patients treated for childhood cancers and especially in acute lymphoblastic leukemia survivors who are, at the same time, more at risk of experiencing precocious cardiovascular and metabolic co-morbidities. The hypothalamic-pituitary axis damage secondary to cancer therapies (cranial irradiation and chemotherapy) or to primary tumor together with lifestyle modifications and genetic factors could affect long-term outcomes. Nevertheless, the etiology of obesity in acute lymphoblastic leukemia is not yet fully understood from this country.

Results

The present review has the aim of summarizing the published data and examining the most accepted mechanisms and main predisposing factors related to weight gain in this particular population.

Conclusions

More studies have been recommended especially when children are on chemotherapy.

Poster Shift 2: Obesity

PREVALENCE OF OBESITY IN A PRIMARY SCHOOL CHILDREN AT A DISTRICT OF ISTANBUL

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Background and Aims

In the last decades childhood obesity epidemic create a major public health problem, mainly as a result of consumption of energy dense foods, large portion sizes, irregular eating patterns, dominance of sedentary life style and low levels of physical activity. School age children may also at risk since they are inactive for long hours and expose to unhealthy food.

The aim of this study to investigate the prevalence of obesity and to assess the influencing environmental factors in children aged 5-10 years in a primary school at Maltepe district in İstanbul.

Methods

This cross-sectional study was carried out in a primary school at Maltepe district in İstanbul. Data is collected from randomly selected 177 students and their families. Students' heights and weights are measured in a standardized way for computation and BMI were computed. WHO growth reference was used for definition of obesity and over-weight status.

Results

The prevalence of obesity and overweight were 12.4% and 20.9% respectively. There was no difference between girls and boys. Significant increase in median values of BMI ($p<0,0001$) and percentage of obesity by age ($p=0,001$) were observed. Having overweight/obese father ($p=0,002$) and working mother ($p=0,003$) were associated with increase in childhood obesity.

Conclusions

School children were found to have high level of obesity and it rises over academic years. Family, school and health care workers contributions are essential to resolve this important public health problem.

Poster Shift 2: Obesity

ASSOCIATIONS BETWEEN OVERWEIGHT AND OBESITY OF 7 YEARS OLD CHILDREN AND THEIR DAILY HABITS

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Background and Aims

Daily lifestyle habits of families depend on many factors: traditions, knowledge, attitudes towards health, financial possibilities, ability to choose, etc. Our aim was to evaluate associations between excess body weight of 7 years old children and their daily habits.

Methods

National Lithuanian children growth surveillance study was performed in 2013. The data were collected participating in the WHO European Childhood Obesity Surveillance Initiative. 4463 first formers were participating in this study. We analysed data collected from 3838 seven years old children. Data related to children habits were collected using questionnaires addressed to their parents. Anthropometric measurements were performed at schools using standardised procedures and equipment. BMI of children was classified using IOTF cut-offs. Associations were analysed using binary logistic regression.

Results

The prevalence of overweight was 12.3 % (n=475), obesity – 6.1 % (n=236). The odds ratio (OR) for being overweight or obese were higher for children who never (OR 1.879, CI 1.411-2.502) or some days (OR 1.31, CI 1.05-1.635) had breakfast compared to those, who had breakfast every day. Playing computer 3 or more hours per day on weekends (OR 1.5, CI 1.06-2.143), being brought from school by car (OR 1.521, CI 1.048-2.208) and never eating fresh vegetables (OR 1.45, CI 1.063-1.976) were main predictors to be overweight or obese.

Conclusions

Obesity and overweight of children were related to modifiable daily habits of children. Obesity control interventions should be focused on changing daily lifestyle habits of families.

Poster Shift 2: Obesity

WEIGHT AWARENESS AMONG PARENTS AND HEALTH CARE PROVIDERS IN SHARJAH, UAE

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Background and Aims

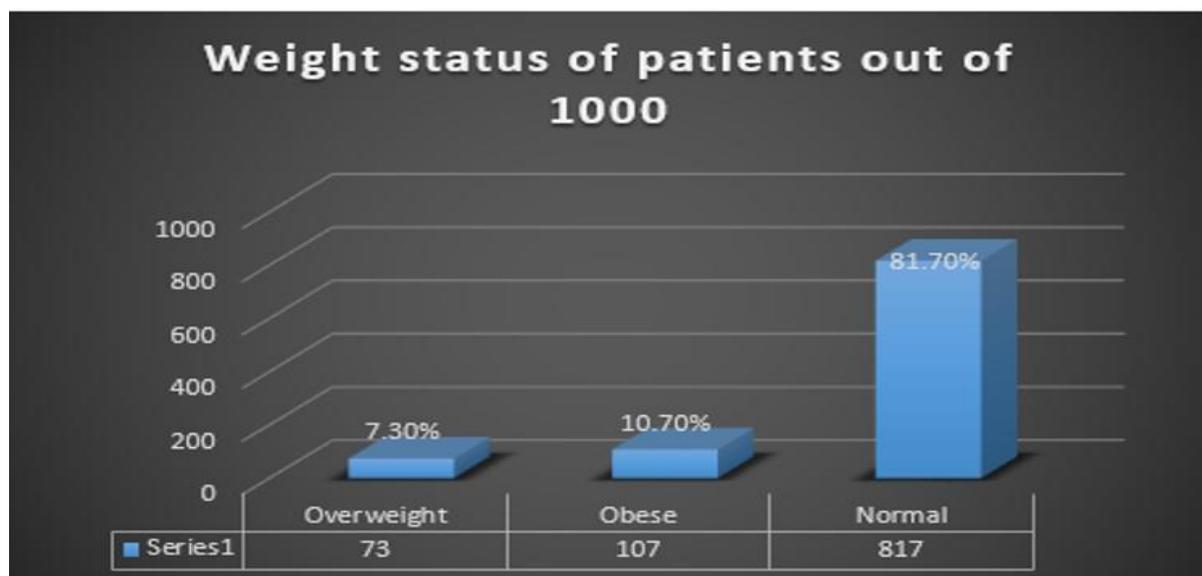
Overweight/obesity is common in UAE as in many parts in the world. Management of obesity in children is usually not rewarding because of many barriers. Prevention of obesity is therefore of priority importance. Proper weight perception and awareness among parents and health care providers are basic prerequisites to achieve this aim.

Aims: This study looks at weight perception among parents and health care providers in Sharjah, UAE.

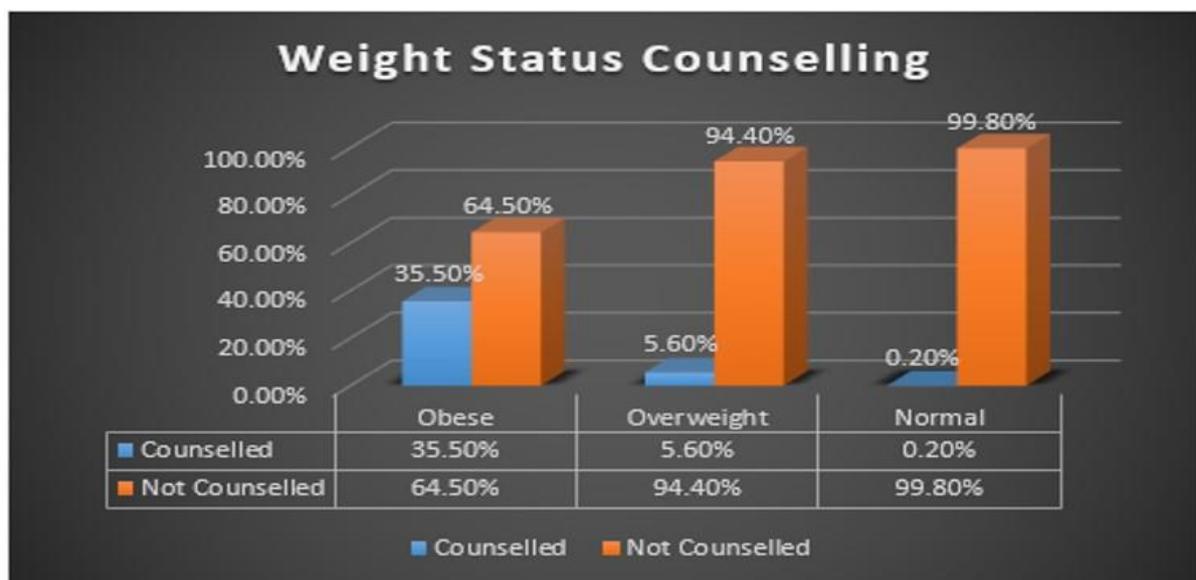
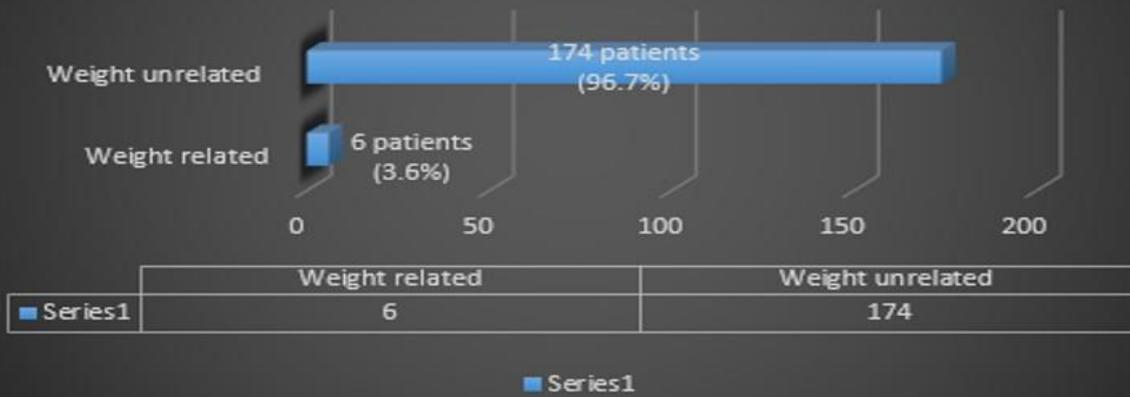
Methods

Retrospective review was done for 1000 patients files aged 2 to 18 years who visited UHS(University Hospital Sharjah) pediatrics OPD during 2015. Purpose of the visit, diagnosis of weight status, documented general and specific weight counseling in cases of overweight/obesity were reviewed. Overweight and obese are defined as > 85th and >95th centiles respectively based on CDC BMI chart.

Results



Reasons for visiting OPD among over-weight and obese individuals



Conclusions

1-Most of parents in UAE have weight misperception and are unaware of overweight/obesity as a medical disease

2-Many paediatricians also have weight misperception; they care for weight issue only if the patient visit is for weight abnormality, even in cases of obesity.

3-Weight counselling in children with normal weight is not a routine practice among most physicians

4- Weight misperception of parents and physicians can be a significant barrier for obesity prevention programme.

5-Health education of parents and training of physicians for weight counselling for all children visiting OPD is recommended for obesity prevention.

Poster Shift 2: Obesity

PARENTAL CHILD FEEDING PRACTICES BY CHILD NUTRITIONAL STATUS AND ENERGY INTAKE REPORTING – FINDINGS FROM THE FAMILY DIET STUDY

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Background and Aims

Given the rising prevalence of childhood obesity in Malaysia, investigation into family environmental factors is warranted, however, current research is limited. Reviews from developed countries report inconsistent findings on impact of parental child feeding practices that affect child weight-related health outcomes. This cross-sectional study aimed to describe and investigate child feeding practices by child nutritional status and energy reporting.

Methods

The Family Diet Study was conducted at five national primary schools with a Malay child aged 8 to 12 years and their main carer(s). Information on socio-demographic, anthropometric measures, dietary intake and parental child feeding practices were collected. The Malaysian-specific recommended nutrient intake, serving sizes, basal metabolic rate equations were used for analyses.

Results

Of the 315 families enrolled, 236 completed all measures (boys, n=112; girls, n=124). Based on WHO 2007 BMI-for-age, one-third of the children were classified as overweight or obese. The majority of reported dietary intakes below recommended nutrients and serving sizes, with more children from obese category identified as under-reporters ($\chi^2=35.5$; $p<0.001$). Three domains for parental child feeding practices had median scores of 4.0 out of 5.0 [concern about child overweight (IQR: 3.3, 4.7); pressure-to-eat (IQR: 3.3, 4.5) and food monitoring (IQR: 3.0, 5.0)]. The perceived child overweight domain had significantly higher median scores amongst overweight children ($\chi^2=37.4$; $p<0.001$) and energy under-reporters ($\chi^2=13.1$; $p=0.001$).

Conclusions

Findings suggest that parents are concerned about their children's weight and parental feeding practices could impact the child nutritional status in Malaysia. Further research examining family environment factors related to childhood obesity is needed.

Poster Shift 1: Other

THE CHILD EATING CAUGHT UP IN THE GENDER

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Background and Aims

Meanings given by mothers to their children eating seem highlight for their complexity causing significance of gender division of labor and pleasure perceived differently. The aim was to show that child eating covered an invisible domestic labor, free and socially little recognized. This was indicate gender significance in these various culinary tasks.

Methods

This study was based on data¹ highlighting social and relational food dimension, and those focused on gender relations linked to eating². Survey was conducted on six socially heterogeneous districts of Oran in 20 mothers with 0 and 7 years children.

Results

Eating pleasure was sexed when father opted for products that meet their expectations and tastes, whereas meals preparation concerned women. It seemed important not to obscure the labor division that set up "naturally" in domestic space: women purchased important and heavier foods, while man was limited to dessert and juice. Mother make wise food choice for her child, trying to find compromises to please first family members, in contrast to her husband, in search of his own culinary desires. Women reference was centered on other family members, contrasts with men cries and exclamations, and metaphors, referring to pleasure, enjoyment.³

Conclusions

This study tries to show gender importance in culinary control modes. Power relations between family members are essential to understand different meanings of child eating which will gradually incorporate, through close family influence, eating habits that are inseparable from his family history.

Corbeau, Poulain. 2008. Privat

Fournier et al. 2015. *J Anthropologues* 140-141,19-49

Stagi . 2015. *J Anthropologues* 140-141, 73-92

Poster Shift 1: Other

THE ROLE OF NATURAL PRODUCTS IN NUTRITION AND THERAPY-GRAPEFRUIT ALCOHOLIC SEED EXTRACT AGAINST ON CANDIDIA ALBICANS RESISTANT TO FLUCONAZOLE AND CLOTRIMAZOLE

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Background and Aims

Numerous biochemical compounds obtained from medicinal plants possess important antimicrobial properties. Application of these compounds is preferred over synthetic drugs as they have long been used in traditional medicine and are considered safe to humans

Candida albicans is an opportunistic pathogen of human mucosal surfaces. Grapefruit seed extract is derived from the pulp and seeds of grapefruit. In this study we evaluated the effectiveness of grapefruit alcoholic seed extract antifungal activity, which are resistant to fluconazole and clotrimazole.

Methods

100 samples were collected from women with vaginitis. In this descriptive analytical study we consider grapefruit alcoholic seed extract effects on *Candida albicans* isolated from corn meal agar or *Saboroud* dextrose agar (SDA) after being isolated from patients. So, this study was in vitro. Dilution method was carried out with RPMI (Roswell Park Memorial Institute Medium). This method was also used for specifying clotrimazole and fluconazole sensitivity and resistance of *Candida*. Seed extracts were dried at 25 °C with mix method. Hydroextract and alcoholic extract were produced with Decoction and Maceration method.

Results

We Found Fluconazol, the control antifungal agent used in this experiment, exhibited the highest inhibitory activity against *C. albicans*, inhibiting the growth rate to 82.5%. The inhibitory activity of clotrimazole occurred within the concentration range of 5×10^{-7} g/ml. Of all cases 30% were resistant to clotrimazole and 17.5% to fluconazol. The alcoholic GSE were effective against *Candida* resistant to clotrimazole and fluconazol. ($p < 0001$)

Conclusions

GSE exhibited inhibitory activity at concentrations of 10% and 20%, lowered the growth rate of *Candida* resistant to clotrimazole and Fluconazol.

Poster Shift 1: Other

THE ROLE OF CITRUS AURANTIUM AGAINST BACTERIA ISOLATED FROM URINARY TRACT INFECTION

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Background and Aims

Background: Emerging antibacterial resistance rates and beta-lactamase producing bacteria recovered from UTI is an increasing problem in different regions, limiting therapeutic options. Therefore, this study aimed at using the extract and essence of Citrus aurantium (abundantly found in Iran) and assessing their effect on bacterial agents causing urinary tract infections, and compare the effect with common antibiotics used in treatment of UTI.

Methods

Materials and Methods: In an experimental design the *E. coli*, *K. Pneumonia*, *Staphylococcus aureus*, *Staphylococcus epidermis*, *Streptococcus agalactiae* and *Enterococcus faecalis* were isolated from UTI and the antibacterial effect of Citrus aurantium against this bacteria were determined using sub culture. Antibacterial effects of the herb extract were evaluated by well diffusion assay and nalidixic acid and Co-trimoxazole were evaluated by agar disc diffusion.

Results

Results: *Enterococcus faecalis* showed 100% sensitivity to extract, essence and Co-trimoxazole, and 80% to nalidixic acid. *E. coli* had 100% sensitivity to Co-trimoxazole, and nalidixic acid and was totally resistant against extract and essence. *Klebsiella Pneumoniae* had 80% sensitivity to trimoxazole, 75% to nalidixic acid and resistance against extract and essence. *Streptococcus agalactiae* showed 100% sensitivity to essence and Co-trimoxazole and 90% sensitivity against nalidixic acid and shown 80% sensitivity to extract. *Staphylococcus aureus* MRSA showed 100% sensitivity to Co-trimoxazole and 70% sensitivities to extract and nalidixic acid.

Conclusions

Conclusion: Detection of antibiotic resistance among isolates is important in prevention and control of infections. In this study, the extracts of Citrus aurantium were found with high antibacterial effects on gram positive bacteria compared with gram negative bacteria.

Poster Shift 1: Other

DETECTION OF MENTHA PIPERITA AND MENTHA SPICATA ETHANOLIC EXTRACT 'S ACTIVITY AGAINST MYCOBACTERIUM BOVIS

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Background and Aims

The plant materials play a major role in primary health care as therapeutic regimen in many developing countries. In the present study, the ethanol extracts of mentha spicata or spearmint (*M. spicata*) and mentha piperita or peppermint (*M. piperita*) have been used to inactive mycobacterium bovis (*M. bovis*) in comparison to isoniazid.

Methods

Patients and Methods: After collecting and identifying the herbs, their ethanolic extract was prepared using percolation method. The extracts of *M. spicata* and *M. piperita* with different dilutions; 0.39,0.78,1.56,3.12,6.25,12.5,25,50,100,200,400 mg/ml were provided. *M. bovis* strain 1173 P2 was used in this study. This microorganism was confirmed by acid-fast staining (Ziehl-Neelsen). The bacteria were incubated at 37 °C for a long time by inoculation into Middle Brook broth (Difco). Biochemical tests such as niacin, nitrate and urease were performed to confirm the organism (e.g. Feingold)(1) Agar diffusion and MIC methods (McFarland standard method and diffusion disk) were used to determine the antimicrobial activity of ethanolic extracts and the inhibition zones formed on the media were measured with a transparent ruler in millimeters.

Results

The in vitro antibacterial activities of ethanolic extracts showed 0.39 mg/ ml consistency of *M. spicata* and 100 mg/ml consistency of *M. piperita* as the least concentrations which inhibit growth of *M. bovis* in comparison with isoniazid.

Conclusions

According to our findings, extracts of *M. spicata* and *M. piperita* could be used as raw materials for phytotherapy because of their antibacterial activities against *M. bovis* as TB etiology

Poster Shift 1: Other

ASSOCIATIONS BETWEEN FOOD SKILLS, FAMILY MEALS AND DIET QUALITY

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Background and Aims

It is strongly believed that food skills have a positive impact on diet quality and nutritional health; however, no national data is available on Canadian families. The purpose of this study was to assess whether food skills and family meal behaviours were associated with diet quality in Canadian parents.

Methods

During an evaluation of a healthy eating campaign, a nationally representative sample of Canadian parents were recruited. Participants were invited to complete food frequency and family meals questionnaires, which included questions from Statistics Canada's Canadian Community Health Survey Food Skills component. Diet quality was assessed with a healthy eating index (HEI) score adapted to the Canadian Food Guide (CFG). Multiple linear regressions, controlling for age and sex, were used to test associations between HEI, food skills and family meals.

Results

The mean HEI score was 76.35 (10.48 SD). Parents who reported cooking with whole ingredients, using the CFG, reading food labels, cooking from scratch (soups/stews and cakes/muffins), adjusting recipes (reducing fat, salt and sugar, and increasing fruits and vegetables and whole grains) and having family meals almost every day had significantly higher HEI scores ($P < 0.05$) than parents who reported fewer foods skills. Budgeting, using grocery lists and including children in meal preparation were not associated with parental HEI.

Conclusions

Greater foods skills and having family meals were associated with significantly higher diet quality in Canadian parents. Promoting food skills to parents could have positive impacts on child and family nutrition.

Poster Shift 1: Other

HALLERVORDEN SPATZ SYNDROME: REPORT OF A CASE ASSOCIATED WITH IRON DEFICIENCY ANEMIA

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Background and Aims

German Pathologists Hallervorder Julius and Hugo Spatz in 1922 described a syndrome that bears their name and surname respectively. This condition is a neurodegeneration of the brain's basal ganglia caused by the accumulation of iron which in turn is due to genetic damage in the chromosome 20p13-p12.3. However, it was not until 1992 that it was best known by the scientific community. Although there have been several case studies where, dental, psychiatric disorders, imaging and anesthesia are emphasized, in this occasion a not reported case in relation to iron deficiency anemia that forced doctors to choose whether or not to perform or treatment with ferrous sulfate is described.

Methods

The case report is described and results of chemical and images are shown.

Results

Therapists did not found evidence of contraindications for the use of iron supplements in the correction of deficit states in patients with neurodegenerative disease associated with cerebral iron accumulation. This is because the accumulation of iron in the basal ganglia does not depend on blood levels of iron but on the enzymatic deficiency associated with the genetic mutation described above.

Conclusions

It is recommended that in these cases, iron supplementation should be done when necessary. However, levels of serum iron, serum ferritin, and percent transferrin saturation should be monitored to avoid excess iron.

Poster Shift 1: Other

LUDIC EXPERIENCE WITH SOUTH AFRICAN CHILDREN'S FEEDING

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Background and Aims

The feeding behavior of children is mainly determined by the family¹. The school appears as an important secondary socializing agency in the formation of this behavior². In South Africa, community Imizamo Yethu, children study full-time and receive processed feeding three times a day, which leads to malnutrition and consequently most of their meals are held in this environment. Considering the nutritional needs of African children, it is also the school that provides a nutritional education. In this context, the learning beneficial habits linked to the social environment can help to stimulate awareness about the role of food and, in a way, remedy such nutritional deficiencies³. This study aimed, through nutrition education games, arouse children's interest in healthy eating.

Methods

Participants: 50 children of Syiazama Educare Centre, aged 3 to 6 years old.

Results

In first, it was noticed resistance of the participants in regards to the ingestion of foods and / or healthy food.

However, the interest in the games contributed positively in the food quality of the participants, and in their choices.

Conclusions

The involvement of children in ludic activities that encourage learning about food establishes a link between the child and the food, making it critical to improving the consumption of healthy foods.

Poster Shift 1: Other

RELATIONSHIPS OF GESTATIONAL WEIGHT GAIN WITH PRE-PREGNANCY BODY MASS INDEX AND MATERNAL AND BIRTH OUTCOMES IN THE MISC COHORT STUDY IN THE UNITED ARAB EMIRATES

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²Universiti Sains Malaysia, Nutrition and Dietetics Program, Kota Bharu, Malaysia

Background and Aims

Pre-pregnancy body mass index (PRE_BMI) and gestational weight gain (GWG) constitute the most important factors that influence maternal and infant outcomes.

To study the patterns of weight gain during pregnancy and the relationship between PRE_BMI, GWG and birth outcome.

Methods

A prospective cohort study recruited 263 pregnant mothers during their third trimester and their newborn in the UAE. Sociodemographic, lifestyle, maternal and infant outcome data were collected.

Results

Mean Prepregnancy BMI was $27.4 \pm 6.3 \text{ kg/m}^2$; and 4.3%, 36.3%, 28.6%, and 30.8% of the women were underweight, normal, overweight and obese respectively. Mean GWG was $11.64 \pm 7.30 \text{ kg}$ and 69% of the women had either inadequate or excessive GWG. The PRE_BMI was a dependent factor that significantly influenced GWG ($p < 0.000$). For normal and underweight subjects, 20% and 18% had excessive GWG. While overweight (49.3%) and obese women (46.6%) gained more than the recommendations. Mean gestational age (GA) was significantly lower among women with excessive GWG as compared to other groups ($P < 0.016$). Logistic regression analysis showed that PRE_BMI, family income, parity, sex of the infant, GA, and gestational diabetes (GDM) were significant predictors of GWG. While PRE_BMI was significantly associated with mother's age, parity, complications during pregnancy, GDM and eating breakfast daily.

Conclusions

This is the first prospective study in UAE and Gulf Region which investigated GWG and its relation to PRE_BMI and showed that GWG was dependent factor on the PRE_BMI. Future preventive strategies, focusing on prepregnancy BMI, monitoring GWG and addressing modifiable risk factors are needed to assure proper neonatal and maternal outcome

Poster Shift 1: Other

DEVELOPMENT OF A SPECIALTY DATABASE FOR EVALUATION OF PROTEIN AND FATTY ACID DIETARY INFORMATION

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Background and Aims

MetabolicPro is a secure web-based diet analysis program designed by Genetic Metabolic Dietitians International (GMDI), initially designed for the evaluation of diets for patients with inborn errors of metabolism (IEM).

Methods

Over the span of 15 months, Metabolic Pro was designed, beta-tested, and deployed. Nutrient data (including amino acids, protein, fatty acids, fat, carbohydrate, vitamins and minerals) are available for all foods. MetabolicPro utilizes the USDA food database and data from manufacturers and information from Amino Acid Analyzer from Abbott Laboratories. The initial goal of this project was to develop a web-based application, which allows dietitians/ nutritionists to evaluate diets with a special emphasis on amino acid content. Since its development and deployment, the program has been further enhanced to evaluate the fatty acid content of diets with special emphasis on long chain and medium chain fatty acids. An important feature of MetabolicPro is the comprehensive inclusion of nutrient data on medical foods (specialty foods) and metabolic formula. All manually entered information has been validated using a three pass system while uploading of USDA database has been validated by sampling foods in numerous categories.

Results

Key features of the application in addition to the database include: recipe analysis, unique food data entry, easy food search, preview of nutrients provided by specific foods, modifiable nutrient standards, downloadable/ printable reports, and exporting of data for further analysis.

Conclusions

Metabolic Pro has been successfully used in research and lends itself to projects where complete amino acid and fatty acid data is needed regardless of patient population.

Poster Shift 1: Other

CELL PROLIFERATION IN TISSUES OF EXPERIMENTAL ANIMALS OF DIFFERENT AGES POSITIVELY CORRELATES WITH THEIR SERUM BLOOD ANTIOXIDANT ACTIVITY

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Background and Aims

Growth of the organism is the result of increasing the number of cells that is regulated by cell proliferation. One of the mechanisms regulating cell proliferation may be the change of a balance between processes of lipid peroxidation (LP) and antioxidant activity (AOA). Our aim was to study the possible dependence of the cells growth in animal tissues from the blood AOA in different age periods.

Methods

Experiments were performed on 30 Wistar rats aged 0.5; 6; 11 and 24 weeks. Cell proliferation and apoptosis were studied by flow cytometry in the thymus and liver of these rats with parallel study of total blood serum AOA (inhibition of Fe²⁺-dependent LP in egg yolk lipoprotein suspension).

Results

The number of cells/g of tissue in both organs, liver lymphocytes and hepatocytes, cell proliferation rate were the highest in newborn animals and decreased with age. Maximum values of the blood AOA were also observed in newborn animals. We observed positive correlations of AOA with the number of cells/g of tissue ($r = 0,387$, $p < 0,05$, and $r = 0,568$, $p < 0,01$, $n = 30$, for liver and thymus, respectively), the number of lymphocytes and hepatocytes in the liver ($r = 0,815$, $p < 0,001$, and $r = 0,485$, $p < 0,01$, respectively) and the number of dividing cells in thymus ($r = 0,789$, $p < 0,001$).

Conclusions

The highest significant correlation was found between the blood AOA and the number of rapidly dividing cell populations - lymphocytes of liver and thymus. High blood AOA may stimulate cell proliferation.

Poster Shift 1: Other

BREASTFEEDING MOTIVATION IN POMERANIA: SURVEY OF NEONATES IN POMERANIA (SNIP-STUDY)

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Background and Aims

The Nationale Stillkommission was founded in Germany in 1994 to increase the acceptance of breastfeeding as the primary means of baby nutrition. Scientific studies demonstrated beginning breastfeeding rates of 90% to 95%, but the total breastfeeding rate decreased to 48-61% after infants were 6 months old. One predictor of breastfeeding duration may be maternal motivation. The present study aimed to describe breastfeeding motivation; we facilitated this analysis by creating a quantitative breastfeeding score.

Methods

We analysed data collected in 2005-2008, during the Survey of Neonates in Pomerania (SNiP). We retrieved data regarding maternal breastfeeding motivation, family environment, and socioeconomic factors. We constructed a quantitative breastfeeding-motivation score to identify factors involved in maternal breastfeeding.

Results

95% of mothers provided information in the survey. The initial breastfeeding rate was 88.4%. The mothers' intentions to provide full breastfeeding increased linearly from 71.9% in 2005 to 76.8% in 2008. Women motivated to provide full breastfeeding were, on average, older, primiparous, and able to deliver spontaneously more often than women with less breastfeeding motivation. Furthermore, women with no motivation to provide full breastfeeding had visited prenatal classes less frequently, had lower levels education, had lower average incomes and consumed tobacco more often than women motivated to provide full breast feeding.

Conclusions

Breastfeeding intentions increased during the Study. This study identified several factors that were associated with breastfeeding intentions in the SNiP study. Women motivated to fully breastfeed their child were, on average, older, more often primiparous, and more often delivered spontaneously compared to women with less breastfeeding motivation.

Poster Shift 1: Other

GLOBAL AWARENESS OF THE DEVELOPMENTAL ORIGINS OF HEALTH AND DISEASES CONCEPTS: A TALE OF TWO SURVEYS

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Background and Aims

The relation between maternal health and disease in later life for the child has been long established^[1] and paved the way for the scientific interest in DOHaD.^[7-10], but has not dramatically changed medical practise.

Methods

A survey on DOHaD concept and maternal health consisting of 15 questions was conducted. 508 healthcare professionals provided feedback: 94 selected experts (group 1); 414 delegates, randomly selected during the WCPM 2015 (group 2).

Results

Over 64% of respondents were moderately to extremely familiar with the DOHaD term. Regarding importance of early, environmental factors in the risk of developing NCDs, 81% of Group 1, but only 68% of Group 2 were moderately to extremely familiar with the concept.

Smoking, stress, diet and obesity were the main factors having significant impact on mothers' health and pregnancy outcomes. 69% of participants used interventions to modulate these factors, while 31% did not. Time for training was given as the main barrier to introduce interventions, but frequently maternal health was 'not seen as a priority'.

Conclusions

The DOHaD concept appears to be familiar across the globe. Yet, there were clear regional differences in factors impacting mothers' health and pregnancy outcomes and gaps in the use of interventions to modulate these factors. The results highlight the need for introduction and support of (ongoing) education and discussion to promote disease prevention to increase awareness to drive improvement in lifelong health for mothers and babies.

Poster Shift 1: Other

MATERNAL NUTRITIONAL FACTORS WHICH RELATED WITH MACROSEMIA IN MANADO CITY

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Background and Aims

During 2012 there were 251 macrosomia in 5258 births in Manado City. Maternal obesity as a risk factor for macrosomia in a few years always increase in North Sulawesi. This study aimed to analyze maternal food intake, maternal history of diabetes, and parity factors.

Methods

This study was an observational analytic study. The study design was selected to determine the risk factors for birth macrosomia (carbohydrate, fat, protein, maternal diabetes mellitus, and parity). This study used a retrospective case study approach, meaning that the effects are identified at this time, while the identified risk factors exist or occurrence in the past.

Results

There are 88 respondents in which the respondents were adequate carbohydrate intake 93.1% delivered macrosomia and 6.9% normal, while respondents were inadequate carbohydrate intake as much as 28.8% delivered macrosomia and 71.2% normal.

Conclusions

High intake of carbohydrates, fats and maternal diabetes history are risk factors for macrosomia. High intake of protein and maternal parity history is not a risk factor for macrosomia

Poster Shift 1: Other

EXPERIENCE ON PEDIATRIC NUTRITION AT "AT END OF LIFE" THE PEDIATRIC ONCOLOGY UNIT AT THE UGANDA CANCER INSTITUTE: WHAT ROLE CAN ONCOLOGY NURSES PLAY

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Background and Aims

Although the majority of childhood cancers are curable, this is not yet true for low resource countries. In Uganda, cancer care is only at the Uganda Cancer Institute.

Between Jan 1st and Dec 31st, there were **4,321** new cancer cases registered and about **8%** were among children. The mortality rate is **70%** annually, that is every **3 in 5** children diagnosed with cancer will not survive past one year after cancer diagnosis.

Here, we review the factors contributing to poor nutritional status in children with cancer.

Objectives

1. To determine the role of an oncology Nurse in nutrition of cancer children.
2. To determine the role of an oncology Nurse at the end of life care of cancer children.

Methods

Observational

Results

Majority of the children present with advanced disease at cancer diagnosis. The chemotherapy is prescribed for palliative intent more frequently and high rates of complications are observed yet no nutritional support is given. Doctors' involvement in decisions regarding nutrition is low. Nutritional status for cancer patients not well perceived among caretakers and some clinicians at UCI. Nurses play an integral role, identifying symptoms, providing care coordination, and counseling mothers on nutrition.

Conclusions

Educational initiatives for patients, families and health-care providers, are essential. The oncology nurses play a key role in the multidisciplinary team approach to ensure nutrition for pediatric patients is good.

Poster Shift 2: Other

THE EFFECTIVENESS OF PUREED FOOD AND ENTERAL FORMULA GASTROSTOMY FEEDING ON IMPROVEMENT OF NUTRITIONAL STATUS OF YOUNG PATIENTS WITH SEVERE NEUROLOGICAL DISORDERS

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Background and Aims

Use of enteral formulas (EF) is recommended for gastrostomy feeding of patients with severe neurological disorders (ND), but home-prepared pureed food (PF) is very popular among certain groups. The aim of the research was to compare the efficacy of two different types of gastrostomy feeding, either EF or PF, on the nutritional status of malnourished children, adolescents and young adults with ND.

Methods

Thirty-seven severely malnourished children, adolescents and young adults (weight-for-age Z score below -2) with severe ND (GMFCS grade V) were randomized to either EF or PF. Diet plans based on calculations of energy, macro and micro-nutrient requirements contained detailed instructions for the amounts and varieties of all foods and drinks. Body weight, ulna length (for calculations of body height) and skinfold thickness (for calculation of body composition) were measured before and after 6 months of nutritional intervention.

Results

Z scores for weight-for-age and BMI-for-age increased more in EF (by 2.07, CI: 1.49 - 2.65 and by 3.75, CI: 2.41 - 5.09, respectively) than in PF group (by 0.70, CI: 0.17 - 1.24; and by 0.63, CI: -0.60 - 1.87, respectively) ($p = 0.0012$ and $p = 0.0014$, respectively). The percentage of fat increased by 6.5 percentage points (CI: 4.5– 8.4) in EF and by 2.6 percentage points (CI: 0.8 - 4.5) in PF group ($p = 0.0051$).

Conclusions

Enteral formulas are more effective for gastrostomy feeding of young malnourished patients with severe ND than diet with pureed food, even when it is carefully designed by professionals.

Poster Shift 2: Other

EXPLORATION OF USE OF WHOLE GRAIN PASTA IN SCHOOL LUNCHES

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Background and Aims

Pasta, especially whole-grain pasta, offers an opportunity to incorporate less expensive, nutritious, and versatile dishes into school meals in India. Pasta is a popular grain food served as an entrée or side dish in both home and away-from-home settings. In schools, pasta is served less frequently than other entrées. A need exists to develop whole-grain pasta products and recipes to assist school nutrition personnel in the procurement, preparation, and service of high quality, nutritious meals. Additionally whole-grain products served in schools must meet the color, taste, and quality expectations of children. Barriers to incorporating pasta into school menus were determined by the use of focus group discussions with SN personnel. An integrated, cooperative effort by industry, government, nonprofit organizations, and schools is required to successfully to incorporate more pasta menu items, particularly whole-grain pasta, in school menus.

Methods

Barriers to incorporating pasta into school menus were determined by the use of focus group discussions with SN personnel.

Results

An integrated, cooperative effort by industry, government, nonprofit organizations, and schools is required to successfully to incorporate more pasta menu items, particularly whole-grain pasta, in school menus.

Conclusions

An integrated, cooperative effort by industry, government, nonprofit organizations, and schools is required to successfully to incorporate more pasta menu items, particularly whole-grain pasta, in school menus.

Poster Shift 2: Other

THE EFFECT OF A SIX-MONTH PHYSICAL ACTIVITY AND NUTRITION EDUCATION PROGRAM ON BIOCHEMICAL HEALTH PARAMETERS, PHYSICAL ACTIVITY AND BODY COMPOSITION IN HEALTHY YOUNG WOMEN

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Background and Aims

It was designed an educational intervention program on nutrition and physical activity (six months) in order to observe its effect on general and specific biochemical parameters; anthropometric parameters, body composition; fitness (VO₂ max) and level of physical activity in college women.

Methods

28 healthy women were included, 18-28 years of age. Before and after the intervention program we have measured, the serum glucose, HDL cholesterol, LDL cholesterol, total cholesterol, triglycerides, prealbumin, albumin, leptin and production of malondialdehyde (MDA). We have also evaluated; body mass index (BMI); body composition; VO₂max and exercise performance (hours / week).

Results

After the intervention program, the albumin concentration and leptin increased. Both, time spent walking and time spent doing vigorous physical activity decreased. Time spent doing moderate intensity activity increased. Before and after intervention, a negative correlation of leptin with the % water ($r = -0.664$; $p < 0.001$) and positive correlations of leptin with BMI ($r = 0.582$; $p < 0.01$) and % fat mass ($r = 0.659$; $p < 0.001$) have been observed. A negative correlations of albumin with MDA ($r = -0.419$; $p < 0.05$) or leptin with VO₂max ($r = -0.498$; $p < 0.05$) have also been observed after intervention

Conclusions

With this intervention program, we have managed to slightly modify the physical activity habits in adult healthy women and have also seen an increase in albumin levels and leptin without modification in body composition.

Poster Shift 2: Other

ASSESSING THE IMPACT OF FOOD ADVERTISEMENT ON PRESCHOOL CHILDREN FROM THE PARENTS'S POINT OF VIEW: PRELIMINARY RESULTS

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Background and Aims

Children spend long periods of time sitting in front of television and watching programs with inappropriate advertising which they are vulnerable to. In this study, we aimed examination of the impact of food advertisements on feeding preferences of children aged 2-5 years stated by their parents.

Methods

This study was designed as both qualitative and quantitative research. Universe consisted of parents having children in any nursery at Maltepe, Istanbul. For data collection, surveys with open-ended questions were delivered to the parents.

Results

The study was conducted with 63 parents. According to parent responses, the proportion of children who believe that advertisement do not always reflect real life is only 8%. Parent and children feeding behaviors were found similar when they were compared according to the number of TV's found at home. Mothers having educational level higher than high school, specified that food ads in TV are broadcasted over normal frequency [30(60%) vs 2(20%)]. Parents who stated that their children are affected by TV ads were found to accept the wishes of their children during supermarket shopping with a greater proportion [15(70%) vs 0(0%)]. Parents think that supervision of food ads on TV is not adequate. "Encouragement of unhealthy products" and "product marketing by emphasizing growth" were found as negative themes. "Encouragement of consuming healthy food like milk and fish" was found as a positive theme.

Conclusions

Arrangements will be made in advertisements for the pediatric age group may play a role in preventing the negative effects of ads and encourages healthy eating behavior.

Poster Shift 2: Other

A NEW MUTATION IN CONGENITAL GLUCOSE GALACTOSE MALABSORPTION SYNDROME

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Background and Aims

Diarrhea is very rare in the first few days of life and is mostly due to congenital malabsorption syndromes. One of these congenital diseases is congenital glucose galactose malabsorption (CGGM). Here we report a newborn baby with CGGM with a new mutation.

Methods

Case: When the patient was 22 days old, he was admitted for persistent diarrhea begun in the 2.day of life and severe dehydration. He had been fed by lactose free formula before however diarrhea persisted, so glucose-galactose free formula was begun in our unit and diarrhea ended. He was discharged with this formula. He is an outpatient and he gains weight regularly. Genetic analysis of the patient was studied with new generation DNA sequencing method and he has been homozygote for NM_00343.3 p.A239D(c.716C>A) mutation in SLC5A1 gene which is a new mutation.

Results

CGGM syndrome is an autosomal recessively inherited disease and more than 40 mutations within the Na⁺/glucose cotransporter gene SLC5A1 associated with CGGM have been discovered. CGGM is due to defect of glucose and galactose transport via intestinal brush cells. Diarrhea is an osmotic diarrhea due to accumulation of glucose and galactose in intestinal lumen.

Conclusions

CGGM is a severe diarrhea and should be in mind in persistent congenital diarrhea.

Poster Shift 2: Other

EFFECT OF 1,25-DIHYDROXYVITAMIN D₃ ON THE TH1/TH2 BALANCE AND NITRIC OXIDE IN TYPE 1 DIABETES

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Background and Aims

Th1 and Th2 are supposed to potentially be dysregulated in type 1 diabetes (T1D), with deviation toward a Th1 cytokines profile. Additionally, increased production of nitric oxide (NO) has been demonstrated to cause insulin-producing pancreatic beta cells damage. The aim of our study was to test if 1,25-dihydroxyvitamin D₃ has an immunomodulatory effect on Th1/Th2 balance and NO production in patients with T1D.

Methods

Peripheral blood mononuclear cells (PBMCs), recovered after parental consent from peripheral blood of children with recent T1D and control subjects (n = 16 in each group) were stimulated with PHA alone or in the presence of 1,25 (OH)₂D₃. Levels of cytokines were measured by a quantitative sandwich enzyme-linked immunosorbent assay. NO levels in the PBMCs culture supernatants were spectrophotometrically determined using the sensitive colorimetric Griess reaction.

Results

IFN- γ and NO production levels were significantly decreased in the presence of 1,25-(OH)₂D₃, while IL-4 levels were significantly increased, when compared to PBMCs stimulated with PHA alone.

Conclusions

Our results demonstrate that vitamin D could play an important role in the protection of beta cells from inflammation. Therefore, it may potentially be suggested as an immunological adjuvant in individuals at risk of the disease.

Poster Shift 2: Other

IMMUNOREGULATORY EFFECT OF VITAMIN D3 ON TH17 / TREG BALANCE DURING TYPE 1 DIABETES

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Background and Aims

It has been reported that vitamin D3 deficiency increases the risk of development of several autoimmune diseases, including Type 1 diabetes (T1D) and several studies have also reported that Th1 and Th17 proinflammatory effectors are involved in the pathogenesis of T1D. In this study, we aimed to evaluate the ex vivo effect of 1,25dihydroxyvitamin D3 on the production of the proinflammatory Th1/Th17 and anti-inflammatory Th2/Treg related cytokines.

Methods

Peripheral blood mononuclear cells (PBMCs), recovered after parental consent from peripheral blood of children with T1D and control subjects (n = 16 in each group) were stimulated with PHA alone or in the presence of 1,25 (OH) 2D3. After 24h of incubation, the cytokine production levels of IL-17 and IL-10 were measured by immunoenzymatic assay.

Results

The production level of IL-17 was higher in the group of patients compared to controls. However, induction of IL-10 was lower in patients compared to healthy subjects. In the presence of 1,25 (OH) 2D3, we observed a significant decrease in the production of IL-17 and a significant increase of IL-10 in patients in comparison with untreated cultures.

Conclusions

Vitamin D3 may play an important role in protecting pancreatic beta cells against inflammation by exerting an immunomodulatory effect on cytokinic balance Th17 / Treg.

Poster Shift 2: Other

DEMOGRAPHICS OF CHILDREN PRESENTING TO A MULTI-DISCIPLINARY FEEDING AND NUTRITION CLINIC AND THEIR PARENTAL COPING STRATEGIES

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Background and Aims

A multi-disciplinary feeding and nutrition clinic (MDC) has been in operation at our institution since November 2012. The clinic is run by paediatricians, dietitians, speech therapists and psychologists. Children with a range of feeding difficulties are assessed and managed in this clinic. We aim to describe the demographics of children presenting to this clinic, as well as parental perceived feeding concerns and parents' coping strategies for these feeding issues.

Methods

This is a retrospective review of children who have been assessed from November 2012 to June 2016. This included pre-clinic assessment forms which parents complete prior to attending the clinic. Questions on this form also assessed whether coping strategies suggested an authoritarian, indulgent or neglectful parenting style.

Results

238 children were seen in this MDC. 144 (60.5%) were males and median (range) age of presentation was 27.0 (1-265) months. 61.3% of parents reported their child's median (range) age at which feeding became a concern was 10.0 (0.5-108) months. 189 completed pre-assessment forms. The main symptoms identified by parents were refusal to eat (62.4%), limited food variety (60.3%) and slow weight gain (50.8%). Common parental coping strategies included giving preferred food (65.0%), distraction during meals (63.0%), coaxing (51.3%) and forced feeding (47.0%). 30.2% reported giving high-caloric milk as a supplement for the perceived poor diet.

Conclusions

Feeding difficulties are often multi-factorial. Caregivers develop a combination of strategies in managing these children. In our population, an indulgent style is the most common approach undertaken by the caregivers.

Poster Shift 2: Other

INFLUENCING FACTORS OF CHILD FEEDING PRACTICES OF CHILDREN UNDER-5 IN BANGLADESH: A QUALITATIVE STUDY

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Background and Aims

Malnutrition is prevalent among children under-5 in Bangladesh. Improving feeding practices is crucial for preventing and reducing malnutrition. We conducted this study to understand the child feeding practices and its underlying factors in order to identify and address the barriers and opportunities for optimal feeding practices.

Methods

Participants were purposively selected, considering the study objectives, from five sub-districts and one urban slum. Data were collected through in-depth interview with caregivers, household observations and focus group discussion with fathers of targeted children. We conducted 46 in-depth interviews with the caregivers of children aged 6-59 months, who feed most of the meals and held 23 day-long household observations. We performed thematic analysis to analyze data.

Results

We observed that most caregivers gave little consideration to nutritional requirements, food diversity and adequacy, and maintaining hygiene while preparing and feeding food to their children. We identified number of factors influencing the feeding practices of the children such as, caregivers' beliefs about certain foods, inability of household head to purchase adequate food, dependency on less-diversified family food, following neighbors' child feeding practices, availability of junk food at the household level and other traditional norms around child's foods.

Conclusions

Overall, inappropriate feeding practices were common among the children under-5 and there were number of factors associated with these practices. Lessons learned from this study can be applied in future intervention programs to ensure optimal feeding practices of the children in Bangladesh.

Poster Shift 2: Other

GROWTH ANOMALIES AND DIFFICULTIES REGARDING NUTRITIONAL THERAPEUTIC MEASURES IN CHILDREN WITH PRIMARY IMMUNODEFICIENCIES. CLINICAL CASES

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Background and Aims

An unexplained failure to thrive represents one of the potential warning signs in patients suffering from primary immunodeficiencies (PIDs). PIDs are also characterised by severe/recurrent infections. Aims. Authors emphasize difficulties regarding the implementation of efficient nutritional measures in 2 children with PIDs.

Methods

First case: 2 year-old girl with severe congenital neutropenia. Second case: 11 month-old male infant with hyper-IgM syndrome phenotype. The first case presented recurrent skin abscesses, chronic purulent otitis media. The second case hospitalisations were justified by pneumonia and frequent purulent otitis. First case clinical exam: impaired nutritional status (-3 SD), suppurative otitis media. Second case: malnutrition (-3 SD), bilateral purulent otitis, pneumonia.

Results

First case investigations: neutropenia, serum immunoglobulins high levels, normal sweat test, negative tests for celiac disease. Bone marrow exam noticed apoptosis of myeloid cells. Second case investigations: IgA/IgG isotypes low levels, IgM isotype high value, no bone marrow abnormalities. No suggestive genetic background was identified in first case (HAX1/ ELA2/ SBDS genes) and second case (DNA sequencing ruled out CD40/ CD40 ligand deficiencies, AICDA /UNG deficiencies). The therapy consisted in broad-spectrum antibiotic/ antifungal regimens, immunoglobulins (second case) and measures for improvement of nutritional status. In evolution, authors noticed recurrence of infections in both cases supporting the malnutrition.

Conclusions

- 1.It's difficult to apply proper and efficient therapeutic nutritional measures in PIDs patients;
- 2.The reduced nutritional status in PIDs children represents not only an important clinical sign, but also a consequence of recurrent infections due to the immunodeficiency.

Poster Shift 2: Other

EFFECTS OF INTERVENTION WITH SUPPLEMENTARY WATER-SOLUBLE FIBER AND FRUIT-JUICE CONCENTRATE OF UME (PRUNUS MUME SIEB. ET ZUCC) ON IMPROVING GASTROESOPHAGEAL REFLUX DISEASE-RELATED SYMPTOMS

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Background and Aims

Fruit-juice Concentrate of Ume is a traditional folk remedy for relief of gastrointestinal disorders. Also, increased fiber intake benefits improving Gastroesophageal reflux disease (GERD). The purpose of this study is to investigate whether supplementation with a combination of water-soluble fiber and fruit-juice concentrate of Ume improves GERD-related symptoms.

Methods

We conducted a randomized, double-blind, placebo-controlled study by supplementing a combination of water-soluble fiber and fruit-juice Concentrate of Ume. A total of 40 patients who were diagnosed as GERD without medicine therapy were randomly assigned to receive treatment group (10g water-soluble fiber and 1g concentrate of Ume juice /day, twice a day) or placebo group for 12 weeks. All participants filled out the Frequency Scale for the Symptoms of GERD (FSSG) questionnaires at baseline, 2, 4, 8 and 12 weeks. In the FSSG, the responses were scored and the reflux score (RS), dysmotility score (DS) and total score (TS) were calculated.

Results

The basic information and scores of FSSG of the participants from two groups showed no significant difference at baseline. Among treatment group, scores of TS/RS/DS are significantly improved at 2, 4, 8 and 12 weeks (respectively, $p < 0.05$, $p < 0.01$, $p < 0.01$, $p < 0.01$ vs. baseline). There is no significant changes in Scores of TS/RS/DS in placebo group at any weeks.

Conclusions

This study indicates that daily Supplementation with water-soluble fiber and fruit-juice concentrate of Ume for 12 weeks significantly improved GERD symptoms, which provided scientific basis to support the use of dietary supplement as a potential therapeutics

Poster Shift 2: Other

MATERNAL GLYCEMIA CUT-OFF FOR THE DETECTION OF ADVERSE PREGNANCY OUTCOMES

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Background and Aims

The risk of adverse pregnancy outcomes of maternal hyperglycemia, which is characterized by value of glucose intolerance intermediate between normal and GDM, remain unclear. This study aims to determine the cut-off for maternal hyperglycemia, less than gestational diabetes mellitus (GDM) for the detection of adverse pregnancy outcomes.

Methods

This was a retrospective cohort study of pregnant women who attended antenatal care at two MCH clinics between January 2010 and December 2012. Socio-demographic, obstetrical and anthropometric data at each antenatal visit, as well as pregnancy outcomes were obtained from medical records. A standard 75g Oral Glucose Tolerance Test was performed between 24th and 30th weeks of gestation with target testing time at 28th week.

Results

A total of 1967 pregnant women with normal glycemia (at 10-13th weeks) were recruited. Mean fasting plasma glucose (FPG) and 2-hours plasma glucose (2hrPG) were 4.37 ± 0.51 mmol/l and 6.09 ± 1.41 mmol/l, respectively. About 19.4% of women underwent caesarean delivery. One-fifth of infants (10.0%) were with low birth weight (< 2.5 kg). Based on birth weight percentile, one-third of infants (33.7 %) were small-for-gestational-age (SGA) and 7.7% of infants were large-for-gestational-age (LGA). Multivariate analyses will be carried out to determine the association between maternal glycemia categories and the risk of developing adverse pregnancy outcomes, controlling for other factors.

Conclusions

The cut-off for both FPG and 2hPG in this study were lower than that of the MOH criteria for diagnosis of GDM.