

Exercise Related Problems in Children

O-169

EARLY PROGRAMMING OF PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR AT PRIMARY SCHOOL AGE. THE ABCD-STUDY

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Background and aims Energy balance may be affected by developmental (re)programming of physical activity and sedentary behaviour, hence predispose for cardiovascular disease in later life. We hypothesise that low birth weight and accelerated growth in infancy corresponds with lower physical activity levels and more sedentary behaviour at 8–9 years of age, thereby predisposing for obesity.

Methods Physical activity and sedentary behaviour were measured in 183 children (100 boys) of a prospective birth cohort at mean age 8.7 years using accelerometry. Outcomes were minutes per day above moderate activity (>3000 counts/min) and minutes sedentary per day.

Results On average (\pm SD), children participated in 37 (\pm 14) minutes of physical activity and 412 (\pm 45) minutes of sedentary behaviour per day. Low birth weight was not associated with either physical activity or sedentary time. The average standardised growth velocity, however, was positively associated with sedentary time, with an average increase of 7.8 min in daily sedentary time per SD weight gain in infancy. Growth velocity was not significantly associated with physical activity.

Conclusions Infant growth may program sedentary behaviour, but not physical activity levels at age 8–9. Birth weight was not related to either physical activity or sedentary behaviour. Hence developmental effects of growth on childhood energy balance correspond with variations in sedentary behaviour rather than physical activity.

O-170

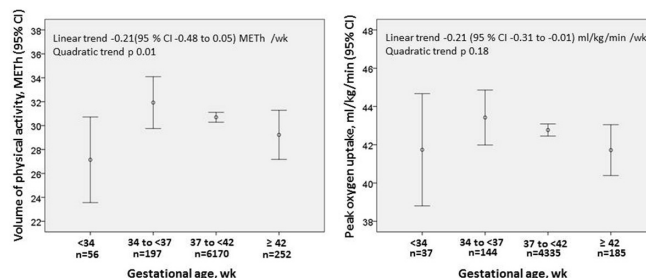
GESTATIONAL AGE IS ASSOCIATED WITH PHYSICAL ACTIVITY AND FITNESS IN ADOLESCENCE – NORTHERN FINLAND BIRTH COHORT 1986

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Background and aims Severely preterm birth is associated with low physical activity and cardiorespiratory fitness. We studied the association of gestational age across its full range with physical activity (self-reported) and cardiorespiratory fitness in adolescence.

Methods Of the 16-year-old members of the population-based Northern Finland Birth Cohort 1986, 6675 singletons with no major physical disability reported the amount of light, brisk and commuting physical activity outside school hours and 4706 completed a submaximal cycle ergometer test for the assessment of cardiorespiratory fitness. Physical activity was summarised as



Abstract O-170 Figure 1 Mean volume of physical activity (METH) per week and peak oxygen uptake (ml/kg/min) with 95% confidence intervals in 4 categories of gestational age

metabolic equivalent hours (METhours) per week and peak oxygen uptake relative to body weight (ml/kg/min) calculated by heart rate responses. To assess the effect of gestational age on the outcomes, the adequate data were analysed by multiple linear regression.

Results There was an inverse U-shaped association between gestational age and physical activity such that adolescents born at both ends of the full range of gestational age undertook less physical activity than others (Figure). These adolescents also seemed to have low cardiorespiratory fitness; however only the linear inverse trend was statistically significant (Figure), suggesting low fitness in those born later gestational ages.

Conclusion Our results are consistent with previous findings of low levels of physical activity in adolescents born severely preterm. We found no evidence of low physical activity and fitness among adolescents born less preterm. Our results also suggest lower physical activity and fitness among adolescents born at later gestational ages; this was post hoc and requires replication.

Gastroenterology II

O-171

THE COMBINED ROLE OF NORMAL BIRTH AND BREASTFEEDING IN ACUTE EARLY CHILDHOOD GASTROENTERITIS

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Background Clinical studies have shown prematurity, birth via caesarean section (CS) and exposure to breastmilk impact the establishment of gut microbiota and immune system in early life and increase susceptibility to acute gut infections. This study aims to investigate the combined association of mode, timing of birth and breastfeeding with acute gastroenteritis (AGE) in early childhood.

Method We conducted a population-based cohort study of 893,360 infants born in New South Wales, Australia, 2001–2011. Data was ascertained via record-linkage of administrative birth, hospital and death data. Follow-up was based on time between discharge at birth to first admission of AGE, sixth birthday, death or study end-date (30/06/2012). Multivariable Cox regression was used to estimate risk of AGE admission adjusted for maternal, obstetric and birth factors.

Results In 2001–2011, there were 41,274 (4.6%) hospital admissions for AGE in childhood; two-thirds admitted.

Conclusion Findings support the biological hypothesis of the importance of mode, timing of birth and breastfeeding in development of gut microbiota and immune system in early life. Spontaneous vaginal birth at 39+ weeks gestation with any exposure to breastmilk at birth minimises the risk of AGE hospital admission in early childhood.

O-172 **INFANT FEEDING AND ANTI-TISSUE TRANSGLUTAMINASE ANTIBODY LEVELS IN CHILDREN WITH SUBCLINICAL CELIAC DISEASE: THE GENERATION R STUDY**

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Objective To examine whether the timing of gluten introduction and breastfeeding duration are associated with subclinical celiac disease in children at the age of 6 years.

Methods This study was embedded in the Generation R study, a population-based prospective cohort study. Participants included 1679 Dutch children positive for HLA-DQ2/DQ8. Data on the timing of gluten introduction (<6 months vs. ≥6 months) and duration of breastfeeding (<6 months vs. ≥6 months) were obtained by questionnaire. Serum samples were analysed for anti-tissue transglutaminase (tTG) levels at age 6 years. Anti-tTG levels were categorised into negative (≤7 U/ml) and positive (>7 U/ml) levels. Positive anti-tTG levels were further categorised based on the ≥10 times upper limit of normal (ULN) levels of the test kit (>7–70 U/ml and ≥70 U/ml). Multivariable logistic regression analyses were performed.

Results Positive anti-tTG levels were found in 43 children of which 26 children had levels above the 10 times ULN (≥70 IU/ml). The introduction of gluten from the age of 6 months onwards and breastfeeding for 6 months or longer were not significantly associated with positive anti-tTG levels. In addition, the timing of gluten introduction and duration of breastfeeding were not significantly associated with positive anti-tTG levels below and above the 10 times ULN.

Conclusions Delayed introduction of gluten beyond the age of 6 months does not increase the risk of subclinical CD. Also, breastfeeding for 6 months or longer does not decrease the risk of subclinical CD in children at 6 years of age.

O-173 **EVALUATING THE POTENTIAL ROLE OF SMALL INTESTINE CONTRAST ULTRASONOGRAPHY IN PAEDIATRIC CROHN'S DISEASE: 5 YEAR EXPERIENCE IN A SINGLE CENTRE**

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Background and aims Small intestine contrast ultrasonography (SICUS) is an emerging, non-invasive technique which accurately

assesses small bowel lesions associated with Crohn's disease (CD) in adult patients, without exposure to medical radiation. We report our 5 year experience in a paediatric cohort.

Methods Patients with suspected or established CD who underwent SICUS were identified and radiological findings collated. SICUS was compared to conventional transabdominal ultrasound (TUS), ileocolonoscopy and magnetic resonance enterography (MRE). Accuracy and agreement of SICUS in detecting small bowel lesions and CD-related complications was assessed using kappa (κ) coefficient statistics.

Results 93 patients (median age 16 years, range 2–20, 49 male) underwent SICUS; 58 had suspected and 35 established CD. In suspected CD, sensitivity and specificity of SICUS in detecting CD small bowel lesions were 81.82% and 100% and TUS 85.71% and 87.50%, respectively. In established CD, sensitivity and specificity of SICUS were 83.33% and 100% and TUS 80.00% and 100%, respectively. Agreement with ileocolonoscopy was fair for the presence of lesions (SICUS, κ=0.38, TUS, κ=0.31). Agreement between SICUS and ileocolonoscopy was good for detecting strictures (κ=0.66) with a sensitivity of 100% and specificity of 97.62%. Comparing SICUS and TUS with MRE, agreement for the presence of lesions was κ=0.63 and 0.53, respectively. Agreement between SICUS and MRE was good for detecting strictures (κ=0.77) and fair for assessing dilatation (κ=0.45).

Conclusions SICUS offers a promising radiation-free, low cost alternative for diagnosing and monitoring paediatric CD small bowel complications. Its wider use should be adopted.

O-174 **THE COMBINATION OF SCGOS/LCFOS WITH FERMENTED INFANT FORMULA REDUCES THE INCIDENCE OF COLIC IN 4 WEEK OLD INFANTS**

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Background and aims The effects on gastrointestinal (GI) tolerance and prevalence of colics (secondary outcome parameters) of a novel infant formula (IF) were explored in a randomised, controlled, double-blind, multicenter intervention study on growth, safety and GI tolerance. The novel IF combined the fermented IF Lactofidus™ (LF) with short-chain galacto-oligosaccharides and long-chain fructo-oligosaccharides (scGOS/lcFOS, ratio 9:1, 0.8 g/100 ml).

Methods 432 healthy, term infants aged 0–28 days were randomised after parent's autonomous decision to discontinue breastfeeding. IF with scGOS/lcFOS and 50%LF (LF50+), IF with scGOS/lcFOS and 15%LF (LF15+), and as controls IF with 50%LF (LF50), or IF with scGOS/lcFOS (IF+) were tested. Parents completed standardised 7-day diaries with daily entries on GI symptoms and crying in monthly intervals until 17 weeks of age. Colic was defined by adapted Rome III criteria.

Results Growth and safety outcomes were within the normal ranges. Based on low mean GI symptom-scores, the newly-developed IFs were well tolerated. The incidence of colic was highest (16.1%) at the 4 week visit and in line with literature (i.e. 20.5% at 4 weeks of age [Iacono *et al.*, 2005]). The incidence of colic was significantly lower with LF50+ (8%) compared to IF+ (20%) (p = 0.034; chi-square test), and LF50 (20%) (p = 0.036) at the 4 week visit. Colic was found to be associated with