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**Background and Aims** To date there are no reports of intra-subject variability for intrahepatocellular lipid (IHCL) assessed using 1H NMR spectroscopy in neonates. This study utilized a high-field (3-Tesla) MRI scanner to perform repeated assessment of IHCL on neonates.

**Methods** Measurements were acquired using a 10 x 10 x 10 mm voxel during 90 seconds. IHCL was assessed using the ratio between the lipid and water peaks. The within subject coefficient of variation (WS CV) was calculated.

**Results** In 15 babies, MRS was measured twice in each lobe in the same region of interest. Values > 0.2 gave reproducible results; the WS CV was 12% on the right and 3% on the left. MRS was measured once in each lobe in 32 babies (GA at birth median 36 weeks, range 24–42; GA at scan median 42 weeks, range 37–46). Among 17 babies with MRS > 0.2 on both sides WS CV calculated between left and right for was 54% (95% CI 50%–58%) and Mean (SD) was 0.73 (0.33) on the right and 0.58 (0.42) on the left (p<0.005).

**Conclusions** Neonatal IHCL measured using 3T is markedly lower than other age groups and systematically higher on the right than the left possibly reflecting the influence of lobe size and cardiac pulsation. Values ≤ 0.2 are imprecise and should be classified as below the limit of quantification. The optimal imaging strategy is likely to use a consistent region of interest within the right lobe.

### 360 SEX DIFFERENCES IN ADIPOSE TISSUE QUANTITY AND DISTRIBUTION IN NEWBORN INFANTS

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**Background and Aims** Adipose tissue (AT) quantity and distribution influence metabolic health. In adult life women have greater total and subcutaneous AT, but men have greater internal abdominal AT (*Gender Medicine*, 2009; 6: 60–75). We aimed to explore AT volume and distribution in newborn male and female infants using magnetic resonance imaging (MRI).

**Methods** A retrospective observational study was performed, using an existing database of neonatal body composition data, to compare male and female healthy term infants.

#### Results

Abstract 360 Table 1 Anthropometry at scan in male and female infants

Measurement; mean (SD)	Male (n=95)	Female (n=90)	p value
Weight (g)	3590 (456)	3475 (496)	0.104
Length (cm)	53.0 (2.2)	52.7 (2.8)	0.435
Head circumference (cm)	36.4 (1.3)	35.8 (1.3)	0.002

Abstract 360 Table 2 AT volume in male and female infants

AT volume (ml); mean [95% CI], after adjustment for scan weight	Male (n=95)	Female (n=90)	p value
Total AT	746 [718, 774]	841 [812, 869]	<0.001
Abdominal superficial subcutaneous AT (SSAT)	102 [97, 107]	122 [117, 128]	<0.001
Non-abdominal SSAT	540 [519, 560]	606 [586, 627]	<0.001
Abdominal deep subcutaneous AT (DSAT)	14 [13, 15]	18 [17, 20]	<0.001
Non-abdominal DSAT	12 [11, 13]	13 [12, 14]	0.008
Abdominal internal AT (IAT)	22 [20, 24]	21 [20, 23]	0.672
Non-abdominal IAT	56 [53, 60]	59 [55, 63]	0.310

**Conclusions** Female newborn infants have higher total and subcutaneous AT, but similar internal abdominal AT compared to males. Longitudinal study is required to assess gender specific alterations in AT distribution during infancy and childhood, and may identify possible influences of internal abdominal AT development in males.

### 361 OVERWEIGHT AND SCHOLASTIC ACHIEVEMENT IN CHILEAN SCHOOL-AGE CHILDREN

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**Background and Aims** Overweight has been linked to health problems and deteriorate school outcomes. Some studies show that overweight school-age children have lower scholastic achievement (SA) but the evidence is controversial. The aim of this study was to determine the association between overweight and SA in elementary fifth grade school children from the Chile's Metropolitan Region.

**Methods** This was an observational, cross-sectional and correlational study. Data were reported for 477 children of both sexes and from 26 schools (public, subsidized and non-subsidized). SA was measured with the Education Quality Measurement System test score (SIMCE), of national coverage. The current nutritional status was assessed through the body mass index z-score (z-BMI), controlling for dietary and physical activity behaviours, socio-economic status (SES, family and educational factors). Data were processed using descriptive statistics and multiple linear regressions from the Statistical Analysis System software (SAS).

**Results** Overweight children had not significantly lower SA compared with non-overweight children (P>0.05). SES (P<0.001), type of school (P<0.01), the number of repeated grades (NRG) (P<0.05) and parents' educational level (P<0.05) were the variables that correlated with SA. SES, the NRG and mother's educational level, were the variables with the greatest explanatory power for SA variance. The current nutritional status expressed as z-BMI did not contribute to explain SA variance.

**Conclusion** Current nutritional status was not associated with SA. SES, the number of repeated grades and mother's educational level could be strong predictors of SA.

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### 362 HIGH INCIDENCE OF IRON DEFICIENCY IN HEALTHY YOUNG INFANTS IN THE NETHERLANDS: PRELIMINARY RESULTS OF THE IROSTAT STUDY

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**Background** Iron deficiency (ID) and iron deficiency anemia (IDA) during infancy are associated with poor neurological development. A food consumption survey in the Netherlands showed that the median iron intake of infants, aged 2 to 3 years, was below the advised adequate intake of 7 mg/day.

**Aim** To investigate the iron status in healthy young infants in the Netherlands and to identify risk factors for ID.

**Methods** We conducted a multi centre, observational study in healthy young infants aged 0.5 to 3 years. We measured serum

ferritin (SF), hemoglobin (Hb) and hemoglobin content in reticulocytes (CHr). We measured C-reactive protein (CRP) to identify infections. Parents filled in a questionnaire to identify risk factors for ID.

**Results** Until now we included 350 healthy infants. Forty infants were excluded (CRP>5 mg/l). ID (SF < 12 µg/l) and IDA (SF < 12 µg/l and Hb < 6.8 mmol/l) were detected in 60 (19.4%) and 27 (8.7%) of the 310 remaining infants respectively. CHr was measured in 249 infants. 32 of 249 (12.9%) infants showed iron deficient erythropoiesis (CHr < 26 pg). Iron intake and use of iron fortified formula were associated with less ID (p=0.02 and p=0.01). Intake of >500 ml cow's milk/day was negatively associated with iron status (p=0.01).

**Conclusion** ID is present in 19.4% of healthy young infants aged 0.5 to 3 years in the Netherlands.

Iron status was positively associated with iron intake and the use of iron fortified formula and negatively associated with excessive intake of cow's milk.

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### SCHOOL-BASED OBESITY AND RELATED CARDIOVASCULAR DISEASE PREVENTION INTERVENTIONS IMPROVE WEIGHT AND ACADEMIC PERFORMANCE OVER A THREE-YEAR STUDY

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**Background** Childhood obesity and related health consequences continue to be major clinical and public health issues in the US and abroad. Healthier Options for Public Schoolchildren (HOPS) was a school-based obesity prevention intervention with nutrition and physical activity components implemented in the elementary school setting and targeting 6–12 year olds.

**Methods** HOPS was implemented in August, 2004 through December 2009, and included approximately 3,200 children (48% Hispanic) attending four elementary schools in Florida. Demographic, anthropometric (height, weight, body mass index [BMI]) and academic (Florida Comprehensive Assessment Test [FCAT]) were collected during the school year. Interventions included modified dietary offerings, nutrition and lifestyle educational curricula, school gardens, and other school-based wellness projects.

**Results** Repeated measures analysis showed over a three year study period the intervention Z weight scores decreased significantly among boys (0.81 to 0.71, P<0.001) with a trend among girls (0.56 to 0.51, P<0.07). Within ethnicity, a significant decrease in Z weight score for Hispanics (0.66 to 0.59 P<0.01) and whites (0.62 to 0.54, p<0.02) was shown. Over the same time period, FCAT math scores improved significantly among girls (308 to 319, p<0.001) and reading scores improved significantly among boys (299 to 307, P<0.01). Within ethnicity, Hispanics significantly improved both FCAT math (298 to 309, p<0.001) and reading (286 to 301, p<0.0001) scores.

**Conclusions** School-based obesity prevention interventions including nutrition and physical activity components show promise in improving health and academic performance in elementary-aged children longitudinally, especially among Hispanics.

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### CESAREAN SECTION IS ASSOCIATED WITH BODY MASS INDEX IN CHILDHOOD IN TWO BRAZILIAN BIRTH COHORT STUDIES

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**Background** A significant association was found between cesarean section (CS) and obesity at adulthood in our previous study.

**Objective** To assess the association between CS and obesity in schoolchildren.

**Methods** We carried out two birth cohorts in Brazil: in Ribeirão Preto (RP) in 1994 and in São Luís (SL) in 1997. 2846 pairs of mothers-newborns were evaluated in RP and 2542 pairs in SL. Birth length and weight and variables were collected after delivery: gender, gestational age, type of delivery, maternal schooling and smoking. In 2004/2005 a random sample were reassessed with anthropometric measurements: 790 children aged 10–11 years in RP and 673 children aged 7–9 years in SL. The outcomes were BMI in Z score and obesity (>95<sup>th</sup> percentile per age). A logistic model was used to investigate the association between CS and obesity. A multiple regression model was applied to investigate the association between CS and BMI.

**Results** Obesity rate was 13% in RP and 2.0% in SL. In the logistic regression, the association between CS and obesity remained significant after adjustment only in RP [1.72 (CI95% 1.01–2.92)]. The linear coefficient after adjustment the association were 0.31 (95%CI 0.11–0.51) in SL and 0.25 (95%CI 0.05–0.46) in RP.

**Conclusion** Cesarean section was associated to increased BMI in both cities, as previously found in adults. CS remained associated with obesity only in RP. We reinforce the previous hypothesis that intestinal flora related to type of delivery may play a role in the epidemic of obesity worldwide.

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### MATERNAL PERCEPTION OF CHILD BODY MASS INDEX (BMI) AND CONCERNS RAISED BY HEALTH PROFESSIONALS

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**Background and Aims** To describe maternal perceptions of their child's BMI and maternal report of concerns about body weight raised by a health professional.

**Methods** Data collection took place in 2010 when children were between 6 and 8 years of age and questionnaires were mailed to 706 mothers who were part of a longitudinal cohort that had been followed since pregnancy. Mothers reported the child's anthropometric measures, and BMI was categorized as underweight, healthy, overweight, or obese based on the child's age and sex according to the World Health Organization Growth Charts adapted for Canada.

**Results** 450 participants completed the questionnaire (response rate 64%). 74% of children had a healthy BMI, 10% were underweight, 9% were overweight, and 7% were obese. 80% of parents whose child was underweight believed their child was about the right weight and only 13% recalled a health professional recently raising concerns about their child being underweight. 89% of parents whose child was overweight believed their child was about the right weight and only 6% recalled a health professional recently raising concerns about their child being overweight. 62% of parents whose children were obese believed their child was about the right weight and only 18% recalled a health professional recently raising concerns about their child being overweight.

**Conclusions** The majority of parents whose children were not a healthy BMI misclassified their child's weight status, suggesting that there are opportunities for health professionals to educate parents about healthy BMI for their child's age and sex.