

Background and aim Established overweight is difficult to reverse. Our aim was to examine the effect of a family oriented intervention program on prevention of persistent overweight in young children at risk.

Methods Parents of overweight pre-school children from half of Oppland county, Norway, were invited to participate in an 3-year structured intervention program which included both group and individually based parental guidance by nurses, paediatricians, nutritionists, psychologists and physiotherapists. Similarly overweight children from the rest of the county, who received no guidance or information about the program, served as controls. Inclusion criterion was weight \geq 1kg above the 97.5 percentile for height according to Norwegian growth charts.

Results Of 50 invited families, 44 were followed through 3 years; 31 of them adhered to the program as scheduled. The sex distribution was similar for the intervention (n=44) and the control (n=30) group (61% vs 63% girls). At entry, the mean (SD) age and mean (SD) body mass index (BMI) of the intervention group were somewhat higher (79 \pm 11, vs 70 \pm 6 months, $p < 0.0005$, and 22.1 vs 20.3 kg/m², $p = 0.003$). The subsequent mean 3-year increase in BMI was similar for both groups (intervention 2.6 \pm 2.2 vs controls 2.1 \pm 2.2 kg/m², $p = 0.35$; for the 31 who adhered to the program 2.5 \pm 2.0, $p = 0.52$ compared to the controls).

Conclusion This 3-year multidisciplinary and multimodal program did not show a benefit on weight development.

46 CHANGE IN REGIONAL ADIPOSE TISSUE AND INTRAHEPATOCELLULAR LIPID IN HEALTHY FULLY BREAST-FED BABIES, BETWEEN BIRTH AND THREE MONTHS

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Background and aims Total adiposity doubles in early infancy¹, however there exists little data describing the change in adipose tissue (AT) distribution and intrahepatocellular lipid (IHCL) over this period. In adults AT distribution and IHCL have important health implications². We aimed to measure the change in AT distribution and IHCL in healthy breastfed babies.

Design Healthy, term, appropriate weight for gestational age infants were recruited from the postnatal ward at Chelsea and Westminster Hospital. Magnetic resonance images and proton spectra were acquired after birth and at 2–3 months as previously described^{3, 4}. IHCL results are presented as the ratio CH₂/water.

Results We studied 32 infants. Change in AT and IHCL are presented in table 1. While total AT volume doubled, there was variation in the magnitude of change in the different regional AT compartments.

Conclusions Growth of different regional AT depots occurs at different rates, and IHCL increases in early infancy. The physiological significance of these novel findings is uncertain.

References 1. Gale C *AJCN* 2012; 2. Fabbrini *PNAS* 2009; 3. Modi N *Pediatr Res* 2006; 4. Thomas EL *ADCFN* 2008.

Abstract 46 Table 1

	First scan	Second scan	% Change (range)	Significance (*paired samples t-test, † related samples Wilcoxon Signed Rank test)
Total adipose tissue, litres - mean (SD)	0.776 (0.187)	1.524 (0.388)	101 (18 to 222)	<0.001*
Abdominal superficial subcutaneous adipose tissue, litres - mean (SD)	0.107 (0.031)	0.253 (0.083)	144 (44 to 323)	<0.001*
Abdominal deep subcutaneous adipose tissue, litres - mean (SD)	0.017 (0.007)	0.039 (0.015)	151 (-46 to 380)	<0.001*
Abdominal internal adipose tissue, litres - mean (SD)	0.019 (0.008)	0.030 (0.014)	75 (-25 to 533)	<0.001*
Ratio of internal abdominal adipose tissue to abdominal subcutaneous adipose tissue - mean (SD)	0.157 (0.056)	0.104 (0.037)		<0.001*
IHCL - median (IQR)	0.65 (0.37–1.90)	1.84 (1.41–2.43)		0.001†

Longitudinal changes in AT compartments and IHCL

47 BOTH SHORT AND LONG SLEEP DURATION MAYBE ASSOCIATED WITH CHILDHOOD OBESITY

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Background There were increasing evidence supporting the presence of the relationship between sleep duration and obesity. However, whether a negative linear trend or a U-shaped pattern could explain the relationship has been a topic of debate.

Objectives To examine whether the possible association between sleep duration and obesity is U-shaped among school-aged children.

Participants and methods A random sample of 20,778 children aged 5.01 to 11.99 years participated in a cross-sectional survey conducted in eight cities of China. The Chinese version of the Children's Sleep Habits Questionnaire was used to collect information on children's sleep behaviors. Height and weight were measured and body mass index (BMI) was calculated. Overweight/obesity was defined by the standardized internationally referenced gender- and age-specific BMI cut-offs.

Results The prevalence of overweight and obesity in our sampled school-aged children was 11.7% and 7.1%, respectively. There was a significant U-shaped relationship between sleep duration and overweight/obesity after adjusting for age, gender, parents' educational levels, family income, media-use, homework schedule, and physical activity. The estimated nadir of the sleep duration curve was approximately 9.4 hours/d for boys and approximately 9.6 hours/d for girls. Interestingly, the U-shaped relationship showed different characteristics between boys and girls. Moreover, dose-effect trend was observed both in boys and girls.

Conclusions Both short and long sleep duration maybe independently associated with a higher risk of overweight/obesity in children, indicating sleep plays a precise and complicated, although unclear, role in the regulation of energy metabolism.

48 CLUSTER-RANDOMISED TRIAL OF A TARGETED INTERVENTION TO PROMOTE EXERCISE SELF-EFFICACY AND REDUCE BMI IN CHILDREN AT RISK OF OBESITY

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Background and aims Being physically active can help to reduce the risk of obesity in later life. This study aimed to evaluate the effectiveness of a targeted, school-based intervention (Steps to Active Kids - STAK) in improving exercise self-efficacy and reducing BMI in children.