

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 a 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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¹C Gale, ¹S Jeffries, ¹KM Logan, ¹JR Parkinson, ¹S Uthaya, ²EL Thomas, ²G Duriguel, ²JD Bell, ¹N Modi. ¹Academic Neonatal Medicine; ²Imperial College, London, UK

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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S Li. School of Public Health affiliated with Shanghai Jiaotong University School of Medicine, Shanghai, China

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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¹C Glazebrook, ¹M Batty, ¹N Mullan, ¹K Sayal, ²D Nathan, ¹L McWilliams, ¹L Hogarth, ³I MacDonald, ⁴A Smyth, ¹M Yang, ¹B Guo, ¹C Hollis. ¹Psychiatry, University of Nottingham; ²Community Paediatrics, Nottinghamshire University NHS Hospitals Trust; ³School of Biomedical Sciences; ⁴School of Clinical Sciences, University of Nottingham, Nottingham, UK

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.

Method STAK is a 12 week, activity programme including activity diary, street dance DVD, circuit training and, for children at or above the 91st centile weight for height, motivational interviewing and goal setting. STAK was evaluated in a cluster-randomised trial in 24 schools. Children aged 9 to 11 were screened for overweight, low exercise self-efficacy or asthma. Twelve schools were randomised to receive the STAK intervention and 12 to control. BMI, waist circumference and exercise self-efficacy were assessed at baseline and post intervention (4 months).

Results Of the 2479 children screened, 1065 children (43%) met the study inclusion criteria. Parents of 424 (40%) children consented to their child's participation with 4 months follow-up data available for 392 (92%). The groups were well matched at baseline. After controlling for baseline values and time between testing, children in the intervention group had higher total self-efficacy at 4 month follow-up. In the group of children who were overweight at baseline (\Rightarrow 91st centile), those in the STAK intervention group had smaller waist circumference and lower BMI at 4 month follow-up.

Conclusion Preliminary analysis suggests that a targeted activity intervention has benefits for children at risk of obesity. Future analyses will explore if benefits are sustained at 12 months follow-up.

49 GETTING UNDER THE SKIN: *STREPTOCOCCUS PYOGENES* IN TOXIC SHOCK

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A Norrby-Teglund. Karolinska Institute, Stockholm, Sweden

Streptococcus pyogenes can cause a variety of diseases in immunocompetent individuals, from pharyngotonsillitis to life-threatening invasive diseases like streptococcal toxic shock syndrome and rapidly progressing deep tissue infections, such as necrotizing fasciitis. Necrotizing fasciitis is often seen in combination with toxic shock, which further increases morbidity and mortality.

To gain insight into the pathogenesis of severe deep tissue infections, we have utilized a snap-frozen tissue biopsy material collected from patients with various soft tissue infections, including necrotizing fasciitis, myositis, and cellulitis caused by *S. pyogenes*. All patients had received intravenous clindamycin in combination with a β -lactam antibiotic at admission.

The studies revealed that severe soft tissue infections are characterized by massive bacterial load, presence of important streptococcal virulence factors including soluble M1-protein, the cysteine protease SpeB and superantigens, DNAses, and heavy infiltration of inflammatory cells and inflammatory mediators. Analyses of host-microbe interactions at the tissue site of infection have furthermore provided *in vivo* evidence for many of the immune evasion strategies previously described *in vitro*. Important bacterial resistance mechanisms at the tissue site include exploitation of human phagocytic cells as host cells thereby allowing persistence intracellularly, as well as protection against antimicrobial peptides by SpeB retained at the bacterial surface through GRAB-a2-macroglobulin complexes. It is clear that the pathogenesis of severe streptococcal tissue infections is multifactorial in nature. This complexity is important to consider in the design of novel therapeutic strategies, where IVIG represent one immunomodulatory therapy that should be evaluated further.

50 LATE ONSET NEONATAL SEPSIS (LOS) IN VERY LOW BIRTH WEIGHT INFANTS: A MULTICENTRIC STUDY IN THE NEOCOSUR SOUTH AMERICAN NETWORK

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¹MJ Escalante, ¹JL Tapia, ¹I D'Aprémont, ²L Villarreal, ³JM Ceriani-Cernadas, ⁴A Bancalari. ¹Neonatology; ²Department of Public Health, Pontifical Catholic University

of Chile, Santiago, Chile; ³Hospital Italiano de Buenos Aires, Buenos Aires, Argentina; ⁴Hospital Guillermo Grant Benavente, Concepción, Chile

Background LOS is an important cause of mortality and morbidity among very low birth weight (VLBW) infants.

Aim To determine the incidence, bacteriology and associated morbidity to LOS over a 10 year period in a South American Network.

Methods Data were prospectively collected with predefined diagnostic criteria on all VLBW infants born in 18 centers from this Network, from 2001 through 2010. For numerical variables, mean and standard deviations were calculated. Students-t test or Chi Square tests were used for comparisons as appropriate. Logistic regression was used to assess association between sepsis and morbidity conditions.

Results 11651 VLBW were included, with a mean BW 1086 \pm 279 g and GA of 29.9 \pm 3 weeks. A 19% acquired LOS, with a slight decrease in incidence from 19.5% in the 2001–2005 period to 17.5% in 2010. There was a wide intercenter variability from 5.9% to 29.6%. The most common pathogens were CONS (53%) and *Staphylococcus aureus* (11%). Infants who developed LOS were significantly smaller by weight and gestational age. Multivariate logistic regression analysis showed a positive association between LOS and an increased risk for patent ductus arteriosus (OR: 1.510 [95% CI: 1.113–2.049]), NEC (OR: 0.427 [95% CI: 0.373–0.488]) and mechanical ventilation (OR: 0.383 [95% CI: 0.327–0.449]).

Conclusions LOS remains an important cause of morbidity among VLBW infants with a wide intercenter variability. Decreasing LOS is a present important challenge for neonatal centers and networks may contribute in this purpose.

51 RESISTIN - A NOVEL FEATURE IN THE DIAGNOSIS OF SEPSIS IN PREMATURE NEONATES

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¹S Ozkiraz, ²Z Gokmen, ³S Kulaksizoglu, ⁴H Kilicdag, ⁴D Ozel, ³A Ecevit, ³A Tarcan. ¹Antalya Training and Research Hospital, Antalya; ²Konya Training and Research Hospital, Konya; ³Baskent University Hospital, Ankara; ⁴Akdeniz University, Antalya, Turkey

Objective To evaluate the efficacy of resistin in the diagnosis of sepsis and to compare with C-reactive protein (CRP) in preterm infants.

Study Design Totally 80 preterm infants were prospectively included in the study. Blood samples were collected within the first hour of life, on first and third days of sepsis for basal resistin, basal CRP, CRP-1, CRP-3, resistin-1 and resistin-3 levels. Septic patients were divided into two groups as Gr-negative and Gr-positive sepsis group.

Results Basal resistin and CRP levels were 14.0 (4.7–31.1) ng/ml and 0.5 (0–23) mg/dL. Culture-proven sepsis was diagnosed in 20 infants. Resistin-1 and resistin-3 were significantly higher than basal resistin levels ($p<0.01$) and positively correlated with CRP. The area under curve values for CRP and resistin were 0.714 and 0.984, respectively ($p=0.039$). Resistin-1 and resistin-3 levels were significantly higher in Gr-negative sepsis group than Gr-positive ($p<0.001$).

Conclusion We showed that resistin had an efficacy superior to that of CRP in the diagnosis of sepsis in preterm infants. Resistin can be used as an early marker for sepsis in premature infants. Further studies are needed in larger groups to better understand the role of resistin to determine cut-off values for Gram-negative and positive sepsis.

52 PAEDIATRIC NEUROLOGICAL DISEASES: WHAT DOES ACTIVE CANADIAN SURVEILLANCE TELL US?

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