

average, this represents 1.6l of water intake per day for females and 2l of water intake per day for males. French national dietary survey (INCA 2) included more than 4000 people aged 3–79 years between 2006 and 2007. Volunteers declared all their food and fluid intake during a 7-d period. Main results of the present study showed (i) total consumption of fluids are 745, 856, 943, 1022, 1491, 1626 and 1422 ml for 3–6, 7–10, 11–14, 15–17, 18–34, 35–59 and ≥60-year-old population, respectively; (ii) 80% of French adults, 18–79 years of age, drink less than 2l of fluids daily; (iii) water is the most consumed fluid in France (~800 ml

on average); (iv) the 25% of higher sugared beverages adult drinkers consume more than 450 ml of SB per day; (v) SB represent 20% of total fluid consumption for children and adolescents (3–17-year-old); and (vi) SB represent on average 17% of simple sugar daily intake for children and adolescents. A very large part of French people should drink more in order to better satisfy water adequate intake proposed by EFSA. In addition, even if water remains the most consumed fluid in France, the consumption of sugared beverages represent significant intake of sugar and simple sugar, especially for children and adolescents.

doi:10.1017/S1368980012001966

Poster Abstracts: Metabolic and Genetic Aspects

22 – Tracking changes in metabolic function with changes in body composition

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Introduction: It is unknown whether changes in body composition measured by either DXA or BIA are predictive of changes in metabolic health in obese children.

Method: Children completed a DXA scan, BIA measurement, an oral glucose tolerance test and a hyperglycaemic clamp at baseline (*n* 113) and follow-up (*n* 64). Differences between sample characteristics and metabolic outcomes were compared, as were changes over time. Linear regressions were used to test the association between change in body composition variables and change in metabolic outcomes adjusting for baseline age, BMI Z-score, ethnicity and gender.

Results: For every 1% increase in PF over time, there was a decline in M and M/LBM of 0.13 and 0.17, respectively, using BIA. Each kilogram increase in BiaFM was predictive of a 0.08 decline in M, a 0.13 decline in M/LBM, a 1.49 decline in IGI and a 4.31 decline in DI over time (*P* < 0.05). Each kilogram increase in DXFM was

predictive of a 0.09 decline in M, a 0.02 decline in M/LBM, a 1.68 decline in IGI and a 4.79 decline in DI over time (*P* < 0.05). For each 1 kg increase in FFM, declines in M/LBM, IGI and DI were observed (0.19; 1.94 and 5.66 for DXAFFM and 0.21; 3.37 and 9.71 for BiaFFM).

Conclusions: Changes in PF, FM and FFM over time as measured by DXA and BIA can indicate associated change in metabolic health in obese children and adolescents. BIA could be used easily in a clinical setting to track such metabolic changes. DXA – dual energy X-ray absorptiometry; BIA – bioelectric impedance analysis; PF – percent fat; M – insulin sensitivity; M/LBM – insulin sensitivity/lean body mass; IGI – insulinogenic index; DI – disposition index.

Funding: Research related to this work was made possible due to grants provided by NICHD (R01-HD40787) and The Irish Fulbright Commission.

doi:10.1017/S1368980012001978

23 – Serum neopterin and tryptophan concentrations in obese children

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Introduction: Neopterin concentrations usually correlate with immune activation and are significant predictors of chronic infections, various types of cancer and CVD. In adults, an association between increased BMI and neopterin concentrations was observed, but although there is evidence for a proinflammatory state accompanied by impaired vascular endothelial function in childhood and adolescence, such data are still scarce.

Method: We investigated serum neopterin concentrations (ELISA, BRAHMS, Hennigsdorf, Germany) as well as tryptophan metabolism (HPLC) in 356 overweight and obese (aged 11.3 (SD 2.97) years; f = m), otherwise healthy children and thirty-two non-obese controls.

Results: BMI differed significantly between obese and non-obese probands (28 (SD 5.64) *v.* 18 (SD 2.19) kg/m², *U* = 9.24,

P < 0.0001, Mann–Whitney *U*-test). Neopterin concentrations were similar in both groups, although low as compared with reported adult data. By contrast, tryptophan concentrations were significantly lower in the obese (74.7 + 18.8 qmol/l) *v.* non-obese subjects (80.7 + 12.7 qmol/l, *U* = 2.384, *P* = 0.017), while there was no difference in kynurenine concentrations.

Conclusions: Obesity in juveniles is not associated with increased neopterin concentrations suggesting that obesity at least in the early course of the disease does not lead directly to Th1-type immune activation and associated CVD. Only in the later course a switch to Th-1 type immune activation and associated CVD may take place. Chronic infections or other cofactors might be important to trigger cytokine production and elevated neopterin concentrations at the later stage.

doi:10.1017/S136898001200198X

24 – May acanthosis nigricans be a predictor of insulin resistance in obese adolescents?

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Introduction: Acanthosis nigricans (AN) is a condition characterized by hyperpigmented, papillomatous and hyperkeratotic skin and is associated with obesity and impaired glucose tolerance. The purpose of the present study was to explore a potential association between BMI, insulin resistance and AN.

Method: A retrospective review of the files of obese adolescents at their first visit to the clinic was conducted. The sample was divided considering the presence or absence of AN. Age, BMI (*Z*-score) and fast glucose and insulin blood levels were compared between the two groups using a bivariate analysis. The insulin resistance index was calculated based on the homeostasis model assessment (HOMA).

Results: Data from 116 obese adolescents, forty-seven males, median age 13 years, was collected. AN was found

in fifty-three subjects: cervical location (21), axilar location (3) and both (15). In fourteen adolescents the location was not specified. Mean BMI *Z*-score was 3.67 within the AN group and 3.03 among those without AN. A mean HOMA of 4.02 was found in the AN group compared with 2.72 among those without AN. A significant association was found between HOMA (*P* = 0.009), BMI *Z*-score (*P* = 0.01) and AN.

Conclusions: According to the results, BMI *Z*-score and HOMA are significantly higher once AN is present. Therefore, the presence of AN should be routinely assessed in obese adolescents. Future research should focus on the association between the improvement of both BMI and HOMA and the regression of AN.

doi:10.1017/S1368980012001991

25 – A case of severe obesity with metabolic syndrome in an adolescent: diagnosis and management

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