

The increase of fatty acid binding protein aP2 in overweight and obese children; interactions with dietary fat and impact on measures of sub-clinical inflammation

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Background: In adults, circulating aP2 may link obesity, inflammation and the metabolic syndrome, but there are few data in children. Experimental models support that dietary factors, particularly dietary fat, may be major determinants of phenotype.

Objective: The aim of this study was to investigate, in normal-, overweight and obese children, the relationships between aP2, the metabolic syndrome, inflammation and diet.

Design: This was a cross-sectional study conducted in Northern Switzerland. The subjects were 6- to 14-year old, prepubertal and early pubertal, normal weight, overweight and obese children (n=124).

Main Outcome Measures: Body mass index, body fat %, waist-to-hip ratio, blood pressure, circulating aP2, fasting insulin, C-reactive protein, plasma lipids and dietary intakes of macro- and micronutrients were determined.

Results: Circulating aP2 markedly increased with increasing central and total adiposity, and predicted measures of insulin resistance. Independent of BMI-SDS and puberty, aP2 correlated with intake of the antioxidant vitamins A, C and E as well as circulating concentrations of CRP, leptin and LDL-cholesterol. Children with lower aP2 concentrations consuming high-fat diets did not show an increase in fasting insulin or CRP, while those with higher aP2 concentrations showed marked increases in these measures with high intakes of fat or saturated fat.

Conclusions: Increased central and overall adiposity in children are associated with higher circulating aP2 concentrations. In children with high dietary intakes of total fat and saturated fat, but not those with low intakes, higher aP2 concentrations are associated with measures of insulin resistance and inflammation.