Reduction of the n-6:n-3 long-chain PUFA ratio during pregnancy and lactation on offspring body composition: follow-up results from a randomized controlled trial up to 5 y of age.

It has been hypothesized that the n-6:n-3 (ω-6:ω-3) long-chain polyunsaturated fatty acid (LCPUFA) ratio in the maternal diet during the prenatal and early postnatal phase positively affects the body composition of the offspring. However, only limited data from prospective human intervention studies with long-term follow-up are available. We assessed the long-term effects of a reduced n-6:n-3 LCPUFA ratio in the diets of pregnant and lactating women [1020 mg docosahexaenoic acid (DHA) plus 180 mg eicosapentaenoic acid (EPA)/d together with an arachidonic acid-balanced diet compared with a control diet] on the body weights and compositions of their offspring from 2 to 5 y of age with a focus on the 5-y results. Participants in the randomized controlled trial received follow-up assessments with annual body-composition measurements including skinfold thickness (SFT) measurements (primary outcome), a sonographic assessment of abdominal subcutaneous and preperitoneal fat, and child growth. In addition, abdominal MRI was performed in a subgroup of 5-y-old children. For the statistical analysis, mixed models for repeated measures (MMMRMs) were fit with the use of data from each visit since birth (except for MRI). Maternal
LCPUFA supplementation did not significantly influence the children's sum of 4 SFTs [means ± SDs at 5 y of age: intervention, 23.9 ± 4.7 mm (n = 57); control, 24.5 ± 5.0 mm (n = 55); adjusted mean difference, -0.5 (95% CI: -2.2, 1.2)], growth, or ultrasonography measures at any time point in the adjusted MMRM model (all P values< 0.05). Results were consistent with abdominal MRI measurements (n = 44) at 5 y of age, which showed no significant differences in subcutaneous and visceral adipose tissue volumes and ratios. The current study provides no evidence that a dietary reduction of the n-6:n-3 LCPUFA ratio in the maternal diet during pregnancy and lactation is a useful early preventive strategy against obesity at preschool age. This trial was registered at clinicaltrials.gov as NCT00362089.