Effect of dietary intervention to reduce the n-6/n-3 fatty acid ratio on maternal and fetal fatty acid profile and its relation to offspring growth and body composition at 1 year of age.

Evidence is accumulating that the long-chain PUFA (LCPUFA) are associated with offspring growth and body composition. We investigated the relationship between LCPUFAs in red blood cells (RBCs) of pregnant women/breastfeeding mothers and umbilical cord RBCs of their neonates with infant growth and body composition. In an open-label randomized, controlled trial, 208 healthy pregnant women received a dietary intervention (daily supplementation with 1200 mg n-3 LCPUFAs and dietary counseling to reduce arachidonic acid (AA) intake) from the 15th week of gestation until 4 months of lactation or followed their habitual diet. Fatty acids of plasma phospholipids (PLs) and RBCs from maternal and cord blood were determined and associated with infant body weight, body mass index (BMI), lean body mass and fat mass assessed by skinfold thickness measurements and ultrasonography. Dietary intervention significantly reduced the n-6/n-3 LCPUFA ratio in maternal and cord-blood plasma PLs and RBCs. Maternal RBCs docosahexaenoic acid (DHA), n-3 LCPUFAs and n-6 LCPUFAs at the 32nd week of gestation were positively related to birth weight. Maternal n-3 LCPUFAs, n-6 LCPUFAs and AA were positively related to birth weight.
associated with birth length. Maternal RBCs AA and n-6 LCPUFAs were significantly negatively related to BMI and Ponderal Index at 1 year postpartum, but not to fat mass. Maternal DHA, AA, total n-3 LCPUFAs and n-6 LCPUFAs might serve as prenatal growth factors, while n-6 LCPUFAs also seems to regulate postnatal growth. The maternal n-6/n-3 LCPUFA ratio does not appear to have a role in adipose tissue development during early postnatal life.