Polyunsaturated fatty acid levels at birth and child-to-adult growth: Results from the MEFAB cohort.


Abstract

BACKGROUND: Prenatal exposure to polyunsaturated fatty acids (PUFAs) may influence childhood growth. However, available evidence mostly derived from short-term studies is inconsistent.

OBJECTIVE: To assess whether fetal PUFA exposure is associated with height and body mass index (BMI), a common measure of adiposity, from 6 months to 23 years of age.

METHODS: In the MEFAB cohort, we assessed cord blood phospholipid n-3 and n-6 PUFA levels, reflecting fetal exposure in late pregnancy. For 250 (45.2% females) participants, we collected a total of 1770 (n= 802 for females) repeated growth measurements from infancy to young adulthood. We examined sex-specific associations of PUFAs with height and BMI at different developmental ages (infant: 6 months; toddler: 2 years; pre-schooler: 4 years; school-aged child: 7 years; adolescent: 12 years; and young adult: 23 years) using fractional polynomial mixed models adjusted for important covariates.

RESULTS: Higher n-3 PUFA levels were associated with higher infant length in males ($\beta= 0.44cm [95\% CI: 0.07, 0.82]$ per SD increase), whereas, for females, higher n-6 PUFA concentrations were associated with lower length in infancy ($\beta= -0.69cm [95\% CI: -1.08, -0.30]$ per SD increase). A higher ratio of n-3 to n-6 PUFAs was associated with higher infant length in both sexes ($\beta= 0.40cm [95\% CI: 0.01, 0.78]$ and $0.42cm [95\% CI: 0.05, 0.79]$ per unit increase for males and females, respectively). These associations were not detectable later in childhood and young adulthood. No associations with BMI were found at any time point examined.

CONCLUSIONS: Our findings suggest a small sex-specific influence of PUFA status at birth on length in infancy, but this does not persist in later life up to young adulthood. PUFA status at birth does not seem to affect BMI from infancy till young adulthood.

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KEYWORDS: Adulthood; BMI; Childhood; Cord blood; Height; PUFAs

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