Association between early and current LCPUFA status on academic achievements at age 7: Is there an early programming effect?

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Introduction

Long-chain polyunsaturated fatty acids (LCPUFA) such as docosahexaenoic acid (DHA) are important constituents of the central nervous system. The incorporation of LCPUFA in the brain occurs mainly during the brain’s growth-sprint in the last trimester of pregnancy and the first year of life. While a number of studies have found positive effects of higher LCPUFA status during pregnancy and of supplementation in the first year on cognition 12, there are studies that do not confirm this 3. The long-term effect of prenatal as well as current LCPUFA status on academic achievements rat school age remains unstudied.

Objective

To study the association between both prenatal and current LCPUFA status on academic achievement of healthy 7-8 year old children.

Study design

Observational study. Children who participated in MEFAB (Maastricht Essential Fatty Acid Birth cohort), a unique historical cohort of about 1100 Caucasian children, were asked to participate in this study, yielding a sample of 150 children. Maternal plasma phospholipid fatty acid status during pregnancy and of the child at age 7 was determined. In addition, venous umbilical cord fatty acid status just after birth was determined. At age 7 school achievement was determined (i.e., reading, spelling and arithmetic) with standard tests used at schools in the Netherlands. Information regarding covariates which could have influenced the child were collected. Data was analysed with a categorical regression analysis (CATREG).

Results

For arithmetic a negative association with DHA was found at all time points. Similar results were seen for AA and EPA. For ObA positive associations were found. For spelling and reading there was a positive association with DHA status at 7 years. For the other FA the association with spelling and reading was less clear.

Discussion

The results of this study are in contrast to our expectations. DHA status during pregnancy, at birth and at 7 years of age was negatively associated with arithmetic scores at age 7. But DHA status at 7 years was positively associated with spelling and reading scores. Overall there does not seem to be a specific early programming effect, but there are effects of early life time exposure to DHA.

Declaration of interest

No conflict of interest

References