The effect of maternal T1DM on the fatty acid composition of erythrocyte phosphatidylcholine and phosphatidylethanolamine in infants during early life.

BACKGROUND: The risk for type 1 diabetes (T1DM) in children of mothers with T1DM is different to that in children of fathers with T1DM. Fatty acid (FA) intake, in particular EPA and DHA, has been associated with T1DM risk and has been suggested to be inadequate in infants of diabetic mothers. We asked, therefore, whether EPA and DHA FA nutritional status in offspring of mothers with T1DM could contribute to their reduced T1DM risk. METHODS: BABYDIET follows children with increased genetic and familial risk for T1DM from birth to age 3 years. FA nutritional state was assessed by determining the erythrocyte membrane phosphatidylethanolamine (PE) and phosphatidylcholine (PC) composition in children of T1DM mothers and children of T1DM fathers or with T1DM siblings participating in the BABYDIET study. Samples for determination of erythrocyte membrane FA composition were collected at ages 3 and 12 months in 48 and 49 infants, respectively. FA measurements were adjusted for breastfeeding duration, FA supplementation, and gluten exposure. RESULTS: 3-months-old children of T1DM mothers and T1DM fathers/sibs had similar levels of PC DHA and EPA (DHA 1.53+/−0.23 vs. 1.65+/−0.11 wt.%; EPA 0.15+/−0.02 vs. 0.21+/−0.03 wt.%) and PE DHA and EPA (DHA 7.54+/−0.37 vs. 7.92+/−0.38...
wt.%; EPA 0.53+/−0.06 vs. 0.61+/−0.04 wt.%). No differences were also observed after stratification for breastfeeding. At age 12 months, a minor reduction of PE DHA was observed in children of T1DM mothers. Expected higher levels for DHA and EPA in fully breastfed children and in children of mothers taking fish oil supplementation were observed at 3 months in all children. Other differences included increased levels of the major saturated FA 16:0 in 3-months-old infants from T1DM mothers (PC 35.45+/−0.35 vs. 33.89+/−0.26 wt.%, mean +/- SEM, P(corr)=0.005; PE 16.13+/−0.39 vs. 14.93+/−0.24 wt.%, P(corr)=0.05). CONCLUSION: Although FA status was not identical in children from T1DM mothers and from T1DM fathers, maternal T1DM was not associated with changes in offspring’s EPA and DHA incorporation into erythrocyte membrane.