

Do 'fish oil fatty acids' during pregnancy matter for the child's later cardiovascular health and growth?

Long chain polyunsaturated fatty acid (LCPUFA) status is associated with risk of cardiovascular diseases in adulthood. This is especially true for low levels of docosahexaenoic acid (DHA), an omega-3 fatty acid that is prominently present in fatty fish. Little is known about the association between fatty acid status during pregnancy and cardiovascular health at older ages. The aim of our observational follow-up study was therefore to evaluate associations between docosahexaenoic acid (DHA) and arachidonic acid (AA, an omega-6 fatty acid)-levels in the walls of the vessels of the umbilical cord and blood pressure and anthropometrics at 9-years. Fatty acid status in the vessel walls of the umbilical cord reflects the status during pregnancy.



Fig. 1. Pregnancy, a time that 'fish oil fatty acids' already matter for the child's later cardiovascular health and growth.

Participants were the 229 children born at term who took part in a randomized controlled trial on the effects of LCPUFA formula supplementation in infants after birth. We previously demonstrated no effect of LCPUFA supplementation after birth on blood pressure and anthropometrics. Blood pressure was chosen as primary outcome; heart rate and anthropometrics as secondary outcomes. So-called multivariable statistics were carried out to correct for factors that could have an effect on the associations, such as social class or maternal smoking during pregnancy.

We found that higher AA levels in the wall of the umbilical vein and artery were associated with lower diastolic blood pressure. AA was not associated with systolic blood pressure. DHA was not

associated with diastolic nor systolic blood pressure. However, the AA:DHA ratio in the umbilical vein was negatively associated with diastolic blood pressure. Heart rate and anthropometrics were not associated with neonatal LCPUFA status.

In conclusion, higher AA levels and a higher AA:DHA ratio at birth are associated with lower diastolic blood pressure at age 9. This suggests that the effect of LCPUFAs at early age is different from that in adults, where DHA is considered protective for cardiovascular health and AA as unhealthy for cardiovascular status. In other words, our data suggest that the effect of fatty acids status during prenatal life on blood pressure at school age is opposite that of the effect during adulthood.

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