

Relationship between high consumption of marine fatty acids in early pregnancy and hypertensive disorders in pregnancy

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Hypertensive disorders in pregnancy, including gestational hypertension (GH) and preeclampsia, are among the most common complications associated with pregnancy, affecting 5-10% of all pregnancies worldwide. Although the outcome for most women and their babies is good, hypertensive disorders remain the leading cause of morbidity and mortality in pregnancy. Thus, the prevention of elevated blood pressure during pregnancy is of clinical importance. Studies focusing on the intake of n-3 LCPUFA suggest a moderate lowering effect on blood pressure, but studies on pregnant women have been more contradictory. Some studies suggest a reduced risk of preeclampsia, whereas others have found no association with either preeclampsia or GH, and still others an increased risk (total PUFA). Oxidative stress, i.e. an imbalance between maternal prooxidants and antioxidants, is thought to be involved in the pathogenesis of GH and preeclampsia. Therefore maternal intake of polyunsaturated fatty acids as well as antioxidant nutrients are of interest. The aim of this study was to investigate if there is a relationship between maternal intake of cod liver oil in early and late pregnancy and hypertensive disorders in pregnancy in a cohort of low risk pregnant Icelandic women

In this observational prospective study, maternal use of cod liver oil, foods and other supplements was estimated with a semi-quantitative food frequency questionnaire covering food intake together with lifestyle factors for the previous three months (n=488). Questionnaires were filled out twice, at between 11 and 15 weeks and between 34 and 37 weeks gestation, respectively. Supplements related to hypertensive disorders in pregnancy, i.e. gestational hypertension and preeclampsia, were presented with logistic regression controlling for potential confounding.

The odds ratio for developing hypertensive disorders in pregnancy for women consuming liquid cod liver oil was 4.7 (95% CI 1.8 – 12.6, P=0.002), after adjusting for confounding factors. By dividing the amount of n-3 long chain polyunsaturated fatty acids (n-3 LCPUFA) into centiles, the odds ratio for hypertensive disorders across groups for n-3 LCPUFA suggested a u-shaped curve (P=0.008). Similar results were found for gestational hypertension alone. Further, the use of multivitamin supplements without vitamins A and D in late pregnancy doubled the odds of hypertensive disorders (OR 2.4, 95% CI 1.0-5.4, P=0.044).

Consumption of high doses of n-3 LCPUFA in early pregnancy, or other nutrients found in liquid cod liver oil, may increase the risk of developing hypertensive disorders in pregnancy. Certainly, n-3 LCPUFA may have positive health effects, but at a certain level, high amounts may be detrimental. Emerging research supports that major benefit of n-3 LCPUFA supplements may occur within the low range of intakes, and thus further studies investigating an optimal and safe amount would be of importance for a community with traditional cod liver oil consumption.