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Long-chain polyunsaturated fatty acids and mercury.

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Background: Maternal fish consumption brings possible risk to the developing fetal brain in the form of methylmercury (MeHg) that accumulates in aquatic food chains worldwide. The risks and benefits of fish consumption during pregnancy is a subject of topical interest and controversy.

Hypothesis: Deleterious effects of fetal MeHg exposure will be masked by beneficial effects of long chain polyunsaturated fatty acids (LCPUFA) exposure in fish eating population.

Methodology: A longitudinal observational study of 229 mother-child pairs in the Republic of Seychelles was undertaken. We measured average maternal hair Hg during pregnancy and maternal serum measures of LCPUFA and assessed relationships with neurodevelopment in the children.

Results: In separate covariate-adjusted models, the psychomotor development index (PDI) of the Bayley Scales of Infant Development –II at 30 months of age, was positively associated ($p < .05$) with maternal (Model 1) docosahexaenoic acid (DHA), (Model 2) the sum of DHA and eicosapentaenoic acid (EPA), (Model 3) the sum of n-3 LCPUFA and negatively associated (Model 4) with the n-6: n-3 LCPUFA ratio using multiple linear regression. In all models showing positive association with LCPUFA, maternal hair Hg was negatively associated with PDI ($p < 0.06$). There was no significant association between fetal exposure to MeHg and PDI when LCPUFA measures were not included in the models ($p > 0.10$).

Implications: These results emphasize the importance of including nutritional (LCPUFA) measures among other co-variates known to influence child development when attempting to uncover possible detrimental effects of fetal exposure to MeHg in observational studies.