

Eating Fish During Pregnancy Provides 'Brain Food' for Child

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BETHESDA, Md., Feb. 16 -- Higher maternal fish consumption during pregnancy benefits a child's neurological development, researchers reported.

Furthermore, the risk from the loss of omega-3 fatty acids by not eating enough fish exceeds the risk of harm from trace amounts of mercury in seafood, Joseph Hibbeln, M.D., of the National Institute on Alcohol Abuse and Alcoholism, and colleagues, reported in the Feb.17 issue of *The Lancet*.

Seafood is the main food source of omega-3 fatty acids, which are essential for optimum neural development. However, in 2004, the FDA and the Environmental Protection Agency advised women who were pregnant or might become pregnant to limit seafood intake during pregnancy to 340 g per week (less than three portions) to avoid exposure to trace amounts of neurotoxins, especially methylmercury.

Poor outcomes associated with insufficient intakes of omega-3 fatty acids during pregnancy include intrauterine growth retardation, delayed or suboptimum depth perception, adverse neurodevelopmental measures, residual deficits in fine motor skills, speed of information processing in infants, and irreversible deficits in serotonin and dopamine release, according to Dr. Hibbeln and colleagues.

To assess the possible benefits and hazards to a child's development of different levels of maternal seafood intake during pregnancy, the researchers analyzed an observational cohort, the Avon Longitudinal Study of Parents and Children.

The analysis included 11,875 pregnant women living in Bristol, England, who completed a food frequency questionnaire at 32 weeks' gestation. Their expected delivery date was between April 1, 1991 and Dec. 31, 1992.

Multivariable logistic regression models included 28 potential confounders assessing social disadvantage and perinatal and dietary items. These were used to compare developmental, behavioral, and cognitive

outcomes of the children from age six months to eight years whose mothers consumed no seafood, some seafood (1g-340 g per week), and more than 340 g per week.

After adjustment, maternal seafood intake during pregnancy of less than 340 g per week was associated with an increased risk at age eight years of the child being in the lowest quartile for verbal IQ (no seafood consumption, odds ratio [OR] 1.48, 95% CI 1.16-1.90; some seafood, 1.09, CI 0.92-1.29; overall trend, $P=0.004$), compared with mothers who consumed more than 340 g per week.

At seven years, low maternal seafood intake was also associated with an increased risk of suboptimum outcomes for prosocial behavior 1.44 (CI 1.05-1.97) for no seafood consumption versus more than 340 g/week.

Overall, the investigators said, the higher the maternal seafood intake, the less likely the infant was to have a poor score. At ages up to 3.5 years, scores were also lower for fine-motor skills, communication, and social development, they reported.

Maternal seafood consumption reached a mean of 235 g a week, resulting in estimated weekly intakes of zero to 15.6 g, and a mean intake of 1.06 g of omega-3 fatty acids a week.

In total, 12% of the women ate no fish during pregnancy, 65% ate up to 340 g per week, and 23% ate more than 340 g per week.

The researchers did not do a detailed analysis of women who took fish-oil supplements because only 205 women (1.7%) took them. The outcomes for women who took supplements but did not eat fish were close to those of mothers who ate fish, they reported.

The relation between maternal seafood intake and the child's communication skills at ages six and 18 months and verbal IQ are the opposite of those anticipated by the U.S. advisory, Dr. Hibbeln and colleagues said in summary.

Discussing potential confounders, the investigators said that seafood intake in the ALSPAC cohort is unlikely to have resulted in a lower exposure to mercury than in the U.S. inasmuch as the mean

consumption of mercury is higher in the British population than in the U.S.

In any observational study the possibility exists that relevant confounders have not been taken into account, the researchers said. They tried to account for these differences by allowing for a variety of factors including social disadvantage.

In addition, they said it was possible that by measuring seafood consumption, they were measuring only the effects of a healthy diet. Further analysis using 12 socially patterned food categories did not change the direction of the results nor did analysis of estimated nutrients in the mother's diet.

Nearly all assessments of dietary intakes are difficult, the investigators said. For example, they did not have information about specific species of seafood or portion sizes. However, the food frequency questionnaire developed for their study was validated in comparison with two biochemical markers for seafood consumption in a subpopulation of this cohort.

In conclusion, the team said, "We recorded no evidence to lend support to the warnings of the U.S. advisory that pregnant women should limit their seafood consumption."

By contrast, they noted that children of mothers who ate small amounts of seafood (less than 340 g a week) were more likely to have compromised neurodevelopment than the children of mothers who ate more seafood than the recommended amounts.

In an accompanying comment, Gary Myers, M.D., and Philip Davidson, Ph.D., of the University of Rochester (N.Y.), wrote that although methylmercury can be neurotoxic, the amount of exposure that constitutes a toxic dose is unknown.

The only confirmed cases of prenatal human poisoning came from Japan in the 1950s and 1960s after massive industrial pollution of nearby waters, they said. Therefore, they added, the findings of this study should be of great interest to government authorities pondering the relative risks and benefits of fish consumption.

A U.S. survey showed that two-thirds of Americans believe that 1,000 to 100,000 U.S. children are poisoned by mercury from eating fish every year. In fact, Drs. Myers and Davidson said that there has

never been even one child with prenatal mercury poisoning from consuming fish documented outside Japan.

The writers questioned whether the government's overall advice to restrict consumption of specific fish that accumulate higher mercury concentrations is "in the public's best interest." A consumer survey suggested that many Americans presented with this advice reduced their intake of all fish, a reduction, which according to the Dr. Hibbeln's study, might result in more harm than good, they wrote.

In this circumstance, in which fish contain both nutrients and toxins that are an essential part of many people's diet, people are probably best served, they said, "by advisories that follow science and that are conservative in the absence of compelling scientific evidence of harm."

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Additional source: The Lancet

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Hibbeln, JR, et al "[Maternal seafood consumption in pregnancy and neurodevelopmental outcome in childhood \(ALSPAC study\): an observational cohort study](#)" *Lancet* 2007; 369: 578-585.

Additional source: The Lancet

Source reference:

Myers, GJ, Davidson PW "[Maternal fish consumption benefits children's development](#)" *Lancet* 2007; 369: 537-539.