

Low fish intake is associated with low blood concentration of vitamin D, choline and n-3 DHA in pregnant women

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Health benefits of fish

- Several studies have investigated the potential health benefits, including those associated with neurological function, of the n-3 fatty acid DHA.
- higher intakes of fish and seafood, which is a major dietary source of DHA reduces risk of diseases such as CVD and some neurological disorders.
- In addition to DHA, fish also provides choline and vitamin D.
- Fish is a major source of the n-3 fatty acid DHA.

Health benefits of fish

positive association between higher intakes of fish during pregnancy and better child neurodevelopment outcome.

- Fish is a source of other nutrients in addition to DHA
- Fish is one of the few natural food sources of this vitamin D



Vitamin D

maternal blood levels of 25-hydroxyvitamin D (25(OH)D) is positively correlated with blood levels of 25(OH)D in the newborn



Objective of study

- The objective of this study is to assess the correlation between the amount of fish intake in women in the first half of pregnancy (16 weeks) and blood concentrations of vitamin D, choline and DHA.



About study

- This study took place in Canada.
- It involved 222 healthy pregnant women
- 20–40 years of age
- collection of dietary and sociodemographic information and venous blood at 16 weeks of gestation.
- Women following a vegan diet, taking fish oils or other fatty acid supplements were not included.

Dietary analyses

- Interview was used to collect data on their dietary intake.
- ruminant and non-ruminant meats, fatty and lean fish, shellfish, poultry, dairy products, fats and oils, nuts, seeds, vegetables, grains, processed and other foods.
- Information on supplement use was recorded, but no measures for assessing daily intake

Blood samples and analytical methods

- Fasting venous blood was collected from each subject in the outpatient laboratory of the British Columbia's Women's and Children's Hospital.



Statistical analysis

- To address whether fish intake was associated with the intake and biochemical measures of DHA, vitamin D and choline status
- they grouped the women by fish intake as <75, 76–149 or >150 g/week.
- One serving of fish in Canada is 75 g.

Result

- 48% of the women consumed <150 g/week of fish.
- They have looked at their dietary intakes and biochemical measures of status for the nutrients of interest.

Results

- Women who consumed <75 g fish/week (n 56) compared to >150 g fish/week (n 116) had lower dietary intake of DHA, total choline and vitamin D ($P<0.001$), and lower total fatty acid, plasma free choline ($P=0.023$) and 25(OH)D ($P<0.01$).
- Dietary intakes and biomarkers of DHA, choline and vitamin D status were assessed to be linked.

results

- Women consuming >150 g/week fish had significantly higher intakes of DHA and higher erythrocyte PE DHA levels, as well as higher choline intakes and plasma free choline concentrations, and higher intakes of vitamin D from foods and plasma 25(OH)D concentrations than women consuming <75 g/week fish.

Dietary intakes from foods and biochemical measures of DHA, choline and vitamin D among Canadian pregnant women at 16 weeks' gestation when grouped by fish intake*

Table 2. Dietary intakes from foods and biochemical measures of DHA, choline and vitamin D among Canadian pregnant women at 16 weeks' gestation when grouped by fish intake*

(Mean values and standard deviations)

	Fish intake (g/week)							
	All women (n 222)		≤75 (n 56)		76–149 (n 50)		≥ 150 (n 116)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dietary intake								
DHA (mg/d)	110	96	28 ^a	19	65 ^b	26	171 ^c	94
Total choline (mg/d)	391	101	353 ^a	91	392 ^b	96	408 ^b	104
Vitamin D (μg/d)	8.0	4.4	6.3 ^a	3.9	7.1 ^a	3.9	9.3 ^b	4.4
Biochemical measures								
Erythrocyte PE DHA (g/100 g total fatty acid)	6.31	1.60	5.25 ^a	1.27	6.29 ^b	1.30	6.83 ^c	1.62
Plasma free choline (μmol/l)	7.15	1.90	6.59 ^a	1.65	7.21 ^{a,b}	1.72	7.40 ^b	2.05
Plasma 25(OH)D (nmol/l)	59.3	26.9	50.3 ^a	20.0	62.3 ^b	24.5	62.5 ^b	29.8

PE, phosphatidylethanolamine; 25(OH)D, 25-hydroxyvitamin D.

^{a,b,c} Mean values within a row with unlike superscript letters were significantly different ($P < 0.05$; ANOVA, *post hoc* Tukey's honest significant difference test).

*Fish includes all finfish and shellfish.

Discussion

- They demonstrate that for a group of healthy pregnant women, fish intake is positively related not only to DHA intake, but also to the intakes of choline and vitamin D from foods.
- observational studies have shown that maternal fish intakes during gestation are positively associated with child performance in tests of neurodevelopment, attributing the benefits of higher fish intakes to DHA.
- It is important that they eat 2 or more than 2 servings of fish per week.

Summary

- this study showed that among Canadian pregnant women, those women consuming >2 servings of fish/week have higher intakes of DHA, as well as choline and vitamin D, and higher biochemical markers of DHA, choline and vitamin D than women consuming <1 serving fish/week.
- While fish is well recognized as an important source of DHA, this study showed the contribution of fish to other nutrients also needed for brain development.

Question

- Do you think the effect of DHA, cholin and vitamin D in neurodevelopment of infant is short term or long term? Why?
- Do you think any other nutrient is associated with this criteria?

Don't forget to eat your fish

Got Fish?

