

Intake of Fish and Omega-3 Fatty Acids and Risk of Stroke in Women

Original Contribution

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FROM ABSTRACT:

Context

Some prospective studies have shown an inverse association between fish intake and risk of stroke, but none has examined the relationship of fish and omega-3 polyunsaturated fatty acid intake with risk of specific stroke subtypes.

Objective

To examine the association between fish and omega-3 polyunsaturated fatty acid intake and risk of stroke subtypes in women.

Design, Setting, and Subjects

Prospective cohort study of women in the Nurses' Health Study cohort, aged 34 to 59 years in 1980, who were free from prior diagnosed cardiovascular disease, cancer, and history of diabetes and hypercholesterolemia and who completed a food frequency questionnaire including consumption of fish and other frequently eaten foods. The 79,839 women who met our eligibility criteria were followed up for 14 years.

Main Outcome Measure

Relative risk of stroke in 1980-1994 compared by category of fish intake and quintile of omega-3 polyunsaturated fatty acid intake.

Results

Compared with women who ate fish less than once per month, those with higher intake of fish had a lower risk of total stroke.

Among stroke subtypes, a significantly reduced risk of thrombotic infarction was found among women who ate fish 2 or more times per week.

Women in the highest quintile of intake of long-chain omega-3 polyunsaturated fatty acids had reduced risk of total stroke and thrombotic infarction.

Conclusions

Our data indicate that higher consumption of fish and omega-3 polyunsaturated fatty acids is associated with a reduced risk of thrombotic infarction.

THESE AUTHORS ALSO NOTE:

An inverse relationship between fish intake and risk of stroke has been reported in several prospective studies.

Mechanisms for protection against stroke by fish intake may include:

- (1) inhibition of platelet aggregation
- (2) lowered blood viscosity
- (3) suppressed formation of leukotrienes (lipid mediators for neutrophil and macrophage aggregation)
- (4) reduction of plasma fibrinogen blood pressure levels
- (5) reduction of insulin resistance

METHODS

The Nurses' Health Study began in 1976, with 121,700 female registered nurses. After exclusions, 79,839 women remained for the analyses.

RESULTS

Among the 79,839 women followed up for 14 years, 574 incident cases of stroke occurred.

Compared with women who ate fish less than once per month, women who ate fish 2 or more times per week had a reduced risk of stroke.

"Women in the highest quintile of omega-3 fatty acids intake had reduced risk of ischemic stroke, thrombotic infarction, and lacunar infarction.

"After further adjustment for other cardiovascular risk factors and selected dietary variables, women in the highest quintile of omega-3 fatty acids intake had significantly reduced risks of total stroke and lacunar infarction and a borderline reduction in risk of thrombotic infarction."

"Women who did not use aspirin and were in the highest quintile of omega-3 fatty acids intake had a significantly reduced risk of thrombotic infarction whereas the trend among aspirin users was nonsignificant."

COMMENT

The authors “observed a significant inverse association between fish intake and risk of stroke, primarily thrombotic stroke, after adjustment for cardiovascular risk factors and selected dietary variables.”

“Risk of thrombotic infarction was significantly reduced by 48% among women who ate fish 2 to 4 times per week.” **[IMPORTANT]**

The reduction in stroke risk associated with fish intake is consistent with several previous prospective studies.

In a Dutch study, men who consumed more than 0.7 oz (20 g) of fish per day were at half the risk of total stroke as men who consumed less fish.

In another study, women who ate fish more than once a week were at about half the risk of total stroke as women who never ate fish.

In this study, there was an inverse association with fish intake and ischemic stroke.

“Women in the highest omega-3 fatty acids intake quintile who did not use aspirin had a significant 49% reduction in the risk of thrombotic stroke.”

“These results support the hypothesis that omega-3 fatty acids are the protective component in fish that reduce the risk of thrombotic infarction.”

Several mechanisms may be involved in the lower stroke risk associated with omega-3 fatty acids:

(1) supplementation of these fatty acids (eicosapentanenoic acid) leads to reduced platelet aggregation and to increased vasodilation.

These alterations of metabolism “are induced 3 to 4 days after the intake of fish oil supplement and persist for 8 to 10 weeks after cessation of intake of the supplement.”

(2) supplementation of omega-3 fatty acids (eg, 15 g/d) also lowers blood pressure levels in hypertensive persons, and reduces plasma fibrinogen concentrations in healthy volunteers.

These effects may contribute to the prevention of atherosclerotic development and the thrombotic process.

(3) supplementation of omega-3 fatty acids decrease whole blood viscosity and an increase in capillary blood flow.

(4) dietary omega-3 fatty acids may reduce insulin resistance and glucose intolerance and this may reduce the risk of lacunar infarction because glucose intolerance and diabetes are strongly associated with risk of this event.

CONCLUSION

Consumption of fish and omega-3 fatty acids is associated with a reduced risk of total stroke and thrombotic infarction.

“These results suggest that regular intake of fish may be beneficial for the prevention of thrombotic infarction in middle-aged US women.”