

Eating Fatty Fish May Cut Women's Kidney Cancer Risk

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STOCKHOLM, Sept. 19 -- Dining on fatty fish at least once a week lowered women's risk of renal cell carcinoma, but lean fish and the shrimp-lobster tribe offered no such benefit, found researchers here.

A preliminary study found that women who consumed one or more servings of fatty cold-water fish per week during an average of 15.3 years had a statistically significant 44% decreased risk of renal cell carcinoma compared with women who eschewed fish, according to a report in the Sept. 20 issue of the *Journal of the American Medical Association*.

For a subset of women with consistent long-term consumption of fatty fish at baseline and 10 years later (one to three servings a month or more), the risk was down 74%, said Alicja Wolk, D.M. Sc., of the Karolinska Institute, and colleagues.

However, consumption of lean fish was not significantly associated with the risk of kidney cancer in any of the follow-up periods, the researchers said.

Fatty fish included salmon, herring, sardines, and mackerel. Lean fish included mainly cod, tuna, and sweet-water fish, as well as seafood such as shrimp, lobster, and crayfish.

The findings came from the Swedish Mammography Cohort, a population-based prospective cohort study of 61,433 women, ages 40 to 76, without a previous diagnosis of cancer at baseline (March 1, 1987 to Dec. 14, 1990). Participants filled out a 67-item food-frequency questionnaire at baseline and in September 1997.

During 940,357 person-years of follow-up, there were 150 incident cases of renal cell carcinoma. After adjustment for potential confounders, the researchers found an inverse association of fatty fish consumption with the risk of kidney cancer (P for trend=0.02), but no association with lean fish consumption.

Compared with no consumption, the multivariate rate ratio (RR) was 0.56 (95% confidence interval 0.35-0.91) for women eating fatty fish once a week or more.

For a subset of 36,664 women who filled out the baseline and the 1997 questionnaires, the RR was 0.26 (CI, 0.10-0.67) for women reporting consistent consumption of fatty fish versus women who ate no fish. There were 40 incident renal cell carcinoma cases during the 1998 to 2004 follow-up, the researchers reported.

On the other hand, the researchers said, there was no statistically significant association with lean fish

or other seafood (multivariate rate ratio [RR], 0.71, 95% CI, 0.34-1.47) for one or more servings per week versus no consumption. Exclusion of the first two years of follow-up did not change the results.

No previous study has investigated the association between fatty fish and lean fish specifically and the risk for renal cell carcinoma, Dr. Wolk said. Previous studies of kidney cancer risk and fish consumption have had inconsistent results and have analyzed total fish consumption not taking into account the large differences between lean and fatty fish in the content of omega-3 fatty acids and vitamin D, she added.

Compared with lean fish, fatty cold-water fish have up to a 20- to 30-times higher content of marine omega-3 polyunsaturated fatty acid, eicosapentaenoic acid, and docosahexanoic acid, all of which have been reported to slow cancer development.

Also, the vitamin D levels in fatty fish are three to five times higher than in lean fish, while lower serum vitamin D levels have also been linked to the development and progression of renal cell carcinoma, the researchers wrote.

The consumption of fatty fish in Sweden has been increasing since the baseline time of this cohort, the researchers wrote. The consumption of salmon, the main fatty fish, almost doubled, and the consumption of canned herring and other fatty fish increased by 50% during the follow-up period. Thus, the consumption of fatty fish during the two study periods may be greater than that reported in this study, they said.

Several molecular mechanisms have been proposed for the effect of marine fatty acids on carcinogenesis. The best known is ascribed to suppression of arachidonic acid-derived eicosanoid biosynthesis, leading to an altered immune response of cancer cells and modulation of inflammation, cell proliferation, apoptosis, and angiogenesis, the researchers wrote.

As for the role of vitamin D, the researchers suggested that low serum levels of vitamin D₃, plentiful in fatty fish, may influence the development and progression of renal cell carcinoma. Vitamin D₃ exerts its biological activity by binding to the vitamin D receptors, which are present in kidney cells. The vitamin D receptor genotype, they said, may play an important role in determining the risk of developing more aggressive kidney cancer.

Turning to the study's limitations, the researchers noted that the self-administered questionnaire may have misclassified several types of fish. Because of the observational nature of the study, it is possible, they said, that an unevaluated risk factor for renal cell carcinoma, correlated with fatty fish consumption, had some effect on the results.

Another limitation, they said is that because they did not analyze the omega-3 fatty acids and vitamin D intakes directly, the explanation of the observed results is based on speculation.

They concluded, "Our results, however, require confirmation because this is the first epidemiological study addressing this issue."

Action Points

When talking to patients concerned about kidney cancer emphasize that the benefits ascribed to fatty, but not lean fish, came from a preliminary epidemiologic study of women and require further confirmation.

Inform interested patients that the beneficial marine fatty fish in this study included salmon, herring, mackerel, and sardines. The lean fish included mainly cod, tuna, and sweet-water fish, as well as seafood such as shrimp, lobster, and crayfish.

Primary source: Journal of the American Medical Association

Source reference:

Wolk, A. et al, "[Long-term Fatty Fish Consumption and Renal Cell Carcinoma Incidence in Women](#)" *JAMA* 2006; 296:1371-1376.