Fish & Melanoma: What's the Connection?

Most melanomas—a series type of skin cancer—are caused by exposure to the sun's UV rays. But can eating fish also contribute to risk?

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You've read the headlines and may have even heard the spiel directly from your doctor: eat more fish, and less red meat. That's why a recent study published in the journal Cancer Causes & Control, is causing such a stir. The study, led by researchers at Brown University, surprisingly found that people who ate the most fish were the most likely to develop melanoma. Before you change your diet, read more about the study, its findings, and limitations.

About the Study:

While 90% of melanomas are believed to be caused by exposure to UV rays from the sun, epidemiologists – researchers who study the distribution, patterns, and determinants of health – are also looking for other genetic or lifestyle factors, including diet, that may contribute to increasing rates of melanoma across the United States.

In this study, led by Eunyoung Cho, MD, data was collected and analyzed from almost 500,000 adults recruited from across the United States to the NCI's NIH-AARP Diet and Health Study. The initial surveys were sent to 3.5 million AARP members — aged 50 to 71 — who lived in one of six states: California, Florida, Louisiana, New Jersey, North Carolina, or Pennsylvania or from the metropolitan areas of Atlanta or Detroit. Each participant reported how often they ate fish during the previous year, in addition to their portion sizes. Dr. Cho and his team then followed participants until they were diagnosed with a melanoma, moved out of the study area, or died due to an unrelated cause.

The researchers then compared rates of new melanomas that had developed in their study population to rates using data from state/local cancer registries over the 15 years of the study. To reduce the impact of confounding variables, they also controlled for a variety of other factors, including: sociodemographic factors; participants' body mass index; physical activity levels; smoking history; family history of cancer; daily alcohol, caffeine and calorie intake; and average ultraviolet radiation levels in each participant's local area.

Study Findings and Observations

They determined that 5,034 people (1%) were diagnosed with melanoma (stage 1 or more advanced) and an additional 3,284 people were diagnosed with melanoma in situ (stage 0). They determined that consuming more fish was associated with increased rates of melanoma. Specifically, they found:

- Participants whose median daily tuna consumption was 14.2 grams had a 20% higher risk of malignant melanoma and a 17% higher risk of stage 0 melanoma.

- Participants whose median daily intake of 17.8 grams of non-fried fish per day had an 18% higher risk of malignant melanoma and a 25% higher risk of stage 0 melanoma.

The study's findings were a surprise, but do come with some important caveats. The researchers did not account for well-known melanoma risk factors, including number of moles, hair color, history of severe sunburns, or sun safety behaviors (such as wearing sunscreen daily). In addition, because fish consumption was only measured upon intake into the study, it may not accurately reflect participant's diet throughout the study or throughout earlier points in their lifetime.

Finally, Dr. Cho cautions that this study was observational in nature and while it did find a modest association between certain types of fish consumption and melanoma this finding CANNOT be interpreted as fish consumption causing melanoma.

For example, studies link poverty with an increased risk of smoking. However, poverty does not cause one to smoke — despite the correlation.

Existing studies have already determined that higher mercury levels in food are associated with increased rates of skin cancer. In the United States, mercury consumption almost exclusively comes from fish.

Because of this, Dr. Cho believes that it is likely bio-contaminants like mercury in the fish, and not the fish itself, that are increasing risk of melanoma.

"We speculate that our findings could possibly be attributed to contaminants in fish, such as polychlorinated biphenyls, dioxins, arsenic and mercury," Cho said. "Previous research has found that higher fish intake is associated with higher levels of these contaminants within the body and has identified associations between these contaminants and a higher risk of skin cancer. However, we note that our study did not investigate the concentrations of these contaminants in participants' bodies and so further research is needed to confirm this relationship."

Should You Stop Eating Fish or Reduce Your Intake?

Experts, including the study's authors, agree that more research is needed before you reduce fish consumption based on this study. This is especially important because fish is protein rich, chock-full of heart-healthy omega-3 fatty acids, and is associated with numerous other benefits from cognitive development to bone health.

If concerned about mercury or other possible contaminants from fish, you can minimize your exposure by choosing low-mercury seafood options. The FDA created the following chart to guide your choices:

FDA chart on low-mercury seafood options

Ultimately, the best way to prevent melanomas and other forms of skin cancer continues to be the adoption of sun safe habits, including never intentionally tanning, applying sunscreen daily, wearing protective clothing, and seeking shade.

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