

Antioxidants can increase rate of melanoma metastasis in mice

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Fresh research at Sahlgrenska Academy has found that antioxidants can double the rate of melanoma metastasis in mice. The results reinforce previous findings that antioxidants hasten the progression of lung cancer. According to Professor Martin Bergö, people with cancer or an elevated risk of developing the disease should avoid nutritional supplements that contain antioxidants.

Researchers at Sahlgrenska Academy, University of Gothenburg, demonstrated in January 2014 that antioxidants hastened and aggravated the progression of lung cancer. Mice that were given antioxidants developed additional and more aggressive tumors. Experiments on human lung cancer cells confirmed the results.

Given well-established evidence that free radicals can cause cancer, the research community had simply assumed that antioxidants, which destroy them, provide protection against the disease. Found in many nutritional supplements, antioxidants are widely marketed as a means of preventing cancer. Because the lung cancer studies called the collective wisdom into question, they attracted a great deal of attention.

Double the rate

The follow-up studies at Sahlgrenska Academy have now found that antioxidants double the rate of metastasis in malignant melanoma, the most perilous type of skin cancer. Science Translational Medicine published the findings on October 7.

"As opposed to the lung cancer studies, the primary melanoma tumor was not affected," Professor Bergö says. "But the antioxidant boosted the ability of the tumor cells to metastasize, an even more serious problem because metastasis is the cause of death in the case of melanoma. The primary tumor is not dangerous per se and is usually removed."

Confirmed the results

Experiments on cell cultures from patients with malignant melanoma confirmed the new results.

"We have demonstrated that antioxidants promote the progression of cancer in at least two different ways," Professor Bergö says.

The overall conclusion from the various studies is that antioxidants protect healthy cells from free radicals that can turn them into malignancies but may also protect a tumor once it has developed.

Avoid supplements

Taking nutritional supplements containing antioxidants may unintentionally hasten the progression of a small tumor or premalignant lesion, neither of which is possible to detect.

"Previous research at Sahlgrenska Academy has indicated that cancer patients are particularly prone to take supplements containing antioxidants," Dr. Bergö says. Our current research combined with information from large clinical trials with antioxidants suggests that people who have been recently diagnosed with cancer should avoid such supplements."

High mortality rate

One of the fastest expanding types of cancer in the developed world, malignant melanoma has a high mortality rate - which is one reason that researchers at Sahlgrenska Academy were so anxious to follow up on the lung cancer studies.

"Identifying factors that affect the progression of malignant melanoma is a crucial task," Professor Bergö says.

Lotions next

The role of antioxidants is particularly relevant in the case of melanoma, not only because melanoma cells are known to be sensitive to free radicals but because the cells can be exposed to antioxidants by non-dietary means as well.

"Skin and suntan lotions sometimes contain beta carotene or vitamin E, both of which could potentially affect malignant melanoma cells in the same way as antioxidants in nutritional supplements," Professor Bergö says.

Other forms of cancer

How antioxidants in lotions affect the course of malignant melanoma is currently being explored.

"We are testing whether antioxidants applied directly to malignant melanoma cells in mice hasten the progression of cancer in the same way as their dietary counterparts," Professor Bergö says.

He stresses that additional research is badly needed.

"Granted that lung cancer is the most common form of the disease and melanoma is expanding fastest, other forms of cancer and types of antioxidants need to be considered if we want to make a fully informed assessment of the role that free radicals and antioxidants play in the process of cancer progression."

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