

Even Brief Exercise Boosts Cancer-Fighting Immune Cells

Breast cancer and lymphoma patients who exercised for just 10 minutes had increased numbers of killer T-cells and natural killer cells.

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Women with breast cancer experienced increases in cancer-fighting immune cells after a brief period of exercise, according to a recent study published in [Nature Scientific Reports](#). A related study, published in [Frontiers in Physiology](#), saw similar results for people with lymphoma.

Both studies showed that a single 10-minute exercise session led to increased numbers and proportions of CD8 killer T cells and natural killer cells, “which are the most important immune cells fighting against cancer,” according to the researchers.

“Cancer treatments can make you tired and lower your motivation for exercise, which is why it is comforting to know that just 10 minutes of cycling or walking to a supermarket, for example, can be enough to boost the body’s immune system,” Tiia Koivula, of the University of Turku in Finland, said in a [news release](#).

A growing body of evidence shows that physical activity is associated with improved outcomes among people with cancer. Recent studies found that exercise can [lower the risk of cancer metastasis](#), helps alleviate symptoms and side effects such as [fatigue](#) and [treatment-related brain fog](#) (“chemo brain”) and improves overall quality of life.

“It was previously thought that cancer patients should just rest after a cancer diagnosis,” Koivula said. “Today, we have more and more researched information that exercise can even improve the prognosis of cancer. However, it is not yet fully known how exercise controls cancer.”

Some research suggests that physical activity helps mobilize immune cells that recognize and attack malignant cells. To test this hypothesis, Koivula and colleagues measured changes in immune cells after exercise in 20 women with newly diagnosed [breast cancer](#) who had not yet started treatment.

The mean age was 58 years. A majority had locally advanced cancer with lymph node involvement, but two had metastatic breast cancer at the time of diagnosis. Two had hard-to-treat triple-negative breast cancer. The participants rode an exercise bicycle calibrated to an intensity

that increased their heart rate but that they could sustain for 10 minutes without exhaustion.

The researchers collected blood samples when the women were at rest, immediately after exercise and again 30 minutes later. Immediately after exercise, the total number of leukocytes (white blood cells) increased by 29%. Looking at specific immune cell types, they found that antibody-producing B cells rose by 18%, CD8 cytotoxic T cells by 34%, monocytes by 51% and a certain type of natural killer cell by 130%.

What's more, mobilization of immune cells into the bloodstream increased as heart rate and blood pressure rose, indicating that more intense exercise was more beneficial.

“Our findings indicate that a single bout of acute exercise of only 10 minutes can cause leukocytosis [increased leukocytes] in breast cancer patients. Mobilization of leukocytes appear[s] to be directly related to the intensity of exercise,” the study authors concluded. “It is possible that the positive effect of exercise on oncologic outcome might be partly due to immune cell mobilization as documented in the present study.”

In the second study, the researchers measured immune cell counts before and after exercise in three people with Hodgkin lymphoma and four with non-Hodgkin lymphoma. All but one were men, and the mean age was 51 years. The participants rode an exercise bike at moderate intensity for 10 minutes.

Here too, the proportion of natural killer cells increased immediately after exercise, falling back to the baseline level at 30 minutes. The proportion of CD8 killer T cells rose while the proportion of CD4 helper T cells declined after exercising, again returning to baseline levels at 30 minutes. No changes in the proportions of B cells, granulocytes or monocytes were observed.

“Our study suggests that the positive effect of exercise on cancer might be partly due to immune cell mobilization and lends support to use of exercise as a standard part of cancer treatments,” the authors wrote.

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