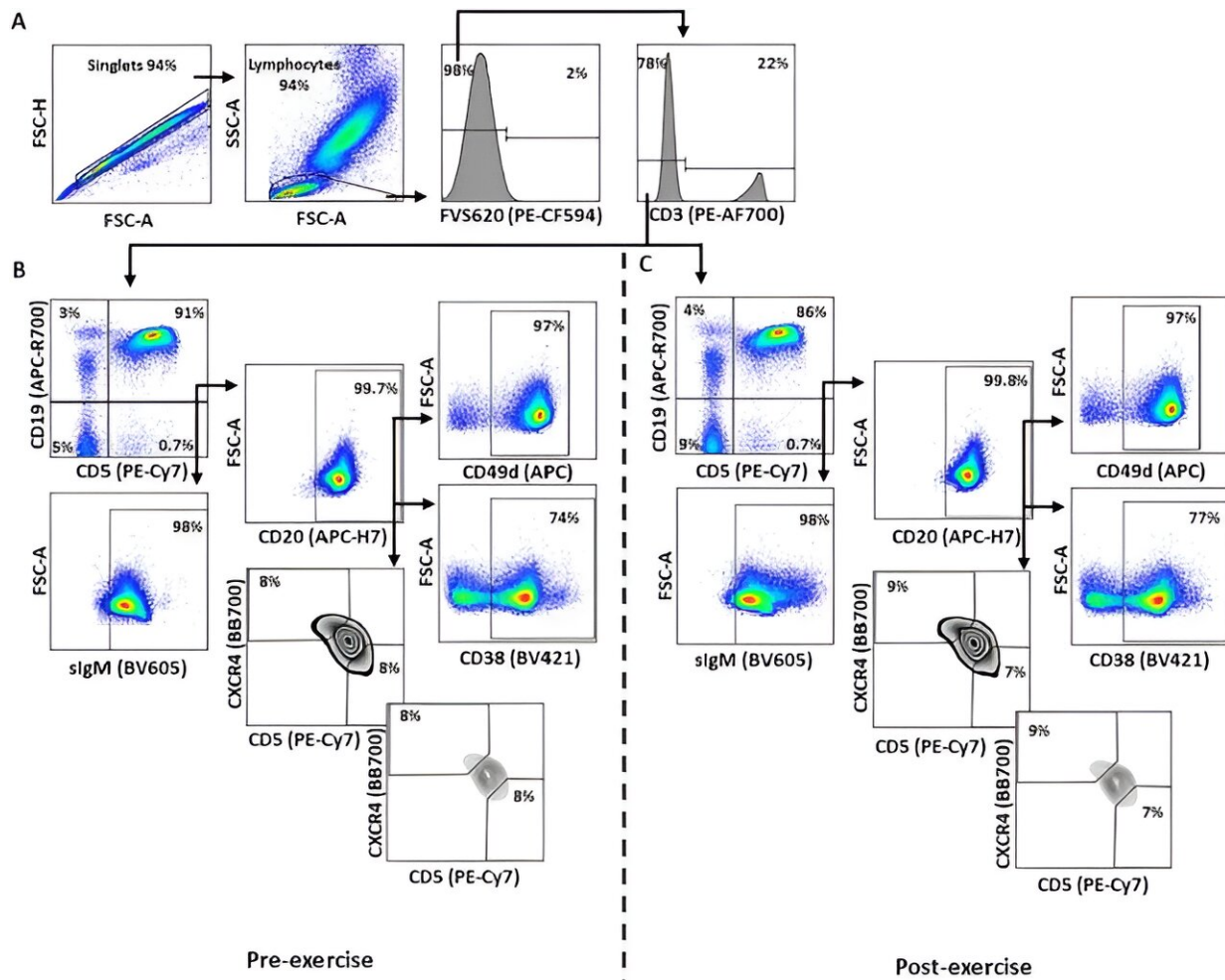


Exercise bouts could improve efficacy of cancer drug

May 21 2024



Representative gating strategy for CLL cells from one participant with treatment-naïve CLL. Credit: *Brain, Behavior, and Immunity* (2024). DOI: 10.1016/j.bbi.2024.03.023

Bouts of moderate-to-vigorous intensity exercise could improve the efficacy of antibody therapies used to treat chronic lymphocytic leukemia, new research has shown.

Researchers at the Universities of Birmingham and Bath found that a bout of exercise increased the number of anti-cancer immune cells—called [natural killer cells](#)—and that these cells were around twice as effective at killing cancer cells in "ex vivo" tests carried out on [blood samples](#) from patients.

In addition, the researchers found that the number of cancer cells present in blood samples transiently increased immediately after exercise—making them more susceptible to attack by natural killer cells and the antibody therapy.

The research could hold promise for antibody therapy treatment for some forms of cancer, although more work is needed to determine the "in vivo" effects in patients undergoing treatment.

Dr. James Turner, a co-author on the study at the University of Birmingham, said, "These findings show a potential benefit to patients undergoing a very particular type of treatment and could open up new avenues of research to determine whether exercise can improve the way other cancer treatments work."

In the study, [published](#) in *Brain, Behavior, and Immunity*, the researchers wanted to test the effects of exercise on an antibody therapy called Rituximab. It is a common treatment for [chronic lymphocytic leukemia](#), which is a cancer of white blood cells, and is the second most common adult blood cancer in the UK. The therapy works by attaching itself to a specific protein on the surface of cancer cells, which natural killer cells are able to recognize and attack.

The researchers worked with 20 people between the ages of 45 and 82 who were diagnosed with chronic lymphocytic leukemia but had not yet begun treatment. Participants were asked to do a 30 minute bout of moderate-to-vigorous intensity cycling. Blood samples were taken before and immediately after the exercise bout, and then a third sample was taken an hour later.

In the blood samples, under "ex vivo" conditions, the researchers measured the number of natural killer cells present at each of the sample points and tested their ability to kill cancer cells with and without Rituximab present.

They found the number of natural killer cells increased by 254% after exercise and that in the blood samples taken after exercise, there were 67% more cancer cells compared to blood before exercise.

Next, the team isolated natural killer cells and put them in close contact with cancer cells for 2 hours "ex vivo" with and without the antibody therapy Rituximab. When Rituximab was also present in the blood sample, natural killer cells were just over twice as effective in killing the cancer cells in the samples collected immediately after exercise compared to before.

Dr. John Campbell, senior author of the study at the University of Bath said, "Cancer cells often try to 'hide' in the body but it seems that exercise works to move them out into the bloodstream, where they are vulnerable to the antibody therapy and the killing capabilities of natural killer cells."

The results of the study could also have potential for patients who have finished their treatment for leukemia and are in a monitoring phase in case cancer cells re-appear.

Dr. Harrison Collier-Bain, first author of the study at the University Bath said, "Monitoring patients after treatment is complicated because if [cancer cells](#) remain or reappear, they are sometimes too low to detect, but a bout of exercise followed by a blood sample immediately afterwards could help to 'find' them if they are 'hiding' in the body."

While these results are promising, larger-scale trials would be needed in a cohort of patients undergoing Rituximab treatment before treatment recommendations could be made.

Caroline Geraghty, Senior Specialist Information Nurse at Cancer Research UK, said, "This study adds to a growing body of evidence showing that exercise can be helpful before, during and after cancer treatment.

"We know that being physically active before and after treatment can help cancer patients cope better with treatment, aid recovery and improve mental well-being. It is interesting to see that exercise could also improve the efficacy of treatment for some types of blood cancer, although more research in a larger group of patients is needed.

"Everyone has different needs and abilities, so it's important that you discuss with your doctor what forms of exercise would work best for you. We encourage all cancer patients to seek their doctor's advice before starting a program of [exercise](#) before or after [treatment](#), to make sure that the activities suggested are appropriate for them."

More information: Harrison D. Collier-Bain et al, A single bout of vigorous intensity exercise enhances the efficacy of rituximab against human chronic lymphocytic leukaemia B-cells ex vivo, *Brain, Behavior, and Immunity* (2024). [DOI: 10.1016/j.bbi.2024.03.023](https://doi.org/10.1016/j.bbi.2024.03.023)

Provided by University of Birmingham

Citation: Exercise bouts could improve efficacy of cancer drug (2024, May 21) retrieved 17 July 2024 from <https://medicalxpress.com/news/2024-05-bouts-efficacy-cancer-drug.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.