

Changes in Monocyte Populations Following Acute Aerobic Exercise in Breast Cancer Survivors

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Abstract

Introduction: Exercise is now strongly recommended for breast cancer patients to improve their overall health and quality of life. Monocytes play an important role in the cancer immune system and a better understanding of how acute exercise alters the monocyte subsets would aid in exercise prescription.

Methods: Ten breast cancer survivors (age: 59 ± 7.1) who completed their primary cancer treatment within the previous year were evaluated in this study. Using flow cytometry, monocyte subset percentages were evaluated before, immediately after, and 1 hour after 45 minutes of acute, intermittent exercise. Exercise intensity was 60% of peak wattage obtained from a cardiopulmonary exercise test.

Results: The percentage of CD14⁺ monocytes and CD14⁺CD16⁻ monocyte subsets changed significantly across the trial ($p = 0.016$ and $p = 0.016$, respectively), with a small, non-significant increase immediately after exercise (CD14⁺: 9%, $p = 0.314$; CD14⁺CD16⁻: 5%, $p = 0.594$) followed by a larger significant decrease 1 hour after exercise relative to baseline (CD14⁺: -26%, $p = 0.015$; CD14⁺CD16⁻: -28%, $p = 0.021$). CD14⁺CD16⁺ subpopulation showed a tendency to change across the trial but this did not quite reach significance ($p = 0.097$).

Conclusion: These findings suggest that acute intermittent exercise mobilizes CD14⁺ monocytes and CD14⁺CD16⁻ monocyte subsets in breast cancer survivors in a manner that is comparable to previous reports in healthy individuals. Further studies are warranted to determine the functionality of the mobilized monocytes and the effects of exercise training.

Keywords: Exercise, Breast Cancer, Monocyte, Immune System