



Mid Atlantic Regional Chapter of the American College of Sports Medicine

45th Annual Scientific Meeting, November 4th- 5th, 2022
Conference Proceedings

International Journal of Exercise Science, Issue 9, Volume 11



Changes in Circulating Angiogenic Cells After Exercise or Flexibility Intervention in Older Men and Women

Madison K. Shoemaker¹, James M. Heilman¹, Katherine I. Kim¹, J. Carson Smith¹, Steven J. Prior^{1,2}. ¹University of Maryland, College Park, MD. ²Baltimore Veterans Affairs Geriatric Research, Education and Clinical Center and Research and Development Service, Baltimore, MD.

Circulating angiogenic cells (CACs) is a term used to describe a wide variety of cell phenotypes and functions that act in a paracrine manner and are closely tied to cardiovascular health. Endothelial progenitor cells (EPCs, defined as CD34+/CD45-/VEGFR2+) and angiogenic T-cells (CD31+/CD3+) are subsets of CACs that have both vasculogenic and angiogenic properties, including vascular repair, endothelial maintenance, and cytokine secretion. Though all CACs tend to decline in number with age, aerobic exercise training is associated with both an increase in number and function of EPCs and angiogenic T-cells in older adults, which is thought to reduce overall cardiovascular disease (CVD) risk through improvements in endothelial cell function. **PURPOSE:** Determine the effects of 6-month, moderate-intensity, aerobic exercise training on EPCs and angiogenic T-cells in older adults. **METHODS:** Twenty older (72 ± 8 yrs) men ($n=5$) and women ($n=15$) participated in a 6-month aerobic exercise intervention (EX) or a 6-month flexibility control (CON). Blood was drawn at baseline and at the 6-month follow-up visit. Peripheral blood mononuclear cells (PBMCs) were isolated via density centrifugation, stained with fluorescent antibodies, and analyzed using a BD FACS Canto II Flow Cytometer. We hypothesized that 6 months of moderate-intensity, aerobic exercise would increase the number of EPCs and angiogenic T-cells. **RESULTS:** There was no interaction or significant effect of EX vs. CON for any CAC subset. However, there was a significant main effect of time across the EX and CON groups for CD31+CD3+ cells (5 ± 1 vs. 16 ± 2 , $p<0.01$) and CD31+ cells (23 ± 3 vs. 38 ± 3 , $p<0.01$). While there was no effect of time or EX vs. CON on EPCs, there was a main effect of time across the EX and CON groups for VEGFR2+ cells (1.0 ± 0.6 vs. 7 ± 2 , $p<0.01$) **CONCLUSION:** The exercise intervention did not have a greater effect on EPCs or angiogenic T-cells compared with flexibility control. However, angiogenic T-cells and

VEGFR2+ cells increased after either exercise or flexibility interventions. While the training intervention was not superior to the flexibility intervention, these data suggest that either intervention may increase the number of certain CACs and trend toward reduced CVD risk.

Supported by NIH R01AG0557552