

The Effects of a Dynamic Warm-Up on Exercise-Induced Redistribution of Monocytes and Natural Killer Cells

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ABSTRACT

Proportions of leukocyte subsets in peripheral blood are altered post-exercise and return to baseline during recovery. This is caused in part by exercise-induced increases in stress hormones. Inclusion of a pre-exercise dynamic warm-up has been shown to decrease markers of cardiovascular stress during exercise. However, whether a warm-up can attenuate changes to the immune system with exercise has not yet been examined **PURPOSE:** To compare monocyte and natural killer (NK) cell mobilization following a bout of high intensity aerobic exercise with and without a dynamic pre-exercise warm-up. **METHODS:** 16 physically active adults (7 women, 27.8±4.4 years) cycled 30 minutes at 80% age predicted maximum heart rate with and without warm-up in a randomized counter-balanced order. Warm-up (10% increase in wattage each min for 10 min) was provided immediately prior to the exercise. Blood collected pre-, post- and 1hour post- exercise was analyzed by flow cytometry to characterize cell populations. Differences in cell proportions across time points and conditions were assessed by maximum likelihood linear mixed models. **RESULTS:** A significant effect of time was shown in monocytes [Classical (CM), intermediate (IM) and non-classical (NM)] and NK cells ($P<0.05$). Proportions of CM decreased, and NM and NK cells increased post-exercise compared to pre-exercise and returned to baseline values 1hour post- exercise. IM was reduced 1hour post-exercise compared to pre- and post- exercise. A significant effect of condition was observed in CM and NM ($P<0.05$), as warm-up reduced CM and increased NM. A significant interaction (time x condition) effect was present for the NK CD56bright and dim subsets. For both subpopulations, the warm-up condition had a significant difference between the pre- and the 1hour post- exercise time points, which was not found without warm up. CD56bright was elevated and CD56dim was decreased 1hour post- with warm up. **CONCLUSION:** Our data indicate that inclusion of a warm-up does not alter exercise-induced perturbations of monocytes and NK cells in a population of physically active young adults. Future work will consider additional cell subsets.