

## **Comparison of 15 Minutes and 30 Minutes of Moderate Intensity Exercise on Natural Killer Cell Levels in Blood**

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### **ABSTRACT**

Exercise has been shown to significantly mobilize white blood cells, such as Natural Killer (NK) cells, transiently into circulation. NK cells are a key part of the innate immune system that can quickly destroy infected cells and can serve as a first line of defense against pathogens. However, the duration of exercise that is needed to significantly increase these cells has yet to be established. **PURPOSE:** Comparing the effects of 15 minutes vs 30 minutes of moderate-intensity exercise on the levels of total NK cells, CD16+, and CD57+ NK cells circulating within the blood. **METHODS:** 9 healthy male and female adults aged 18-40 years old exercised on a stationary bicycle. Blood was collected before, after 15-minutes, and after 30-minutes of exercise. For the exercise, subjects cycled for 5 minutes to determine the resistance to elicit 55% of Heart Rate Reserve: (Maximum heart rate - Resting heart rate) x 55% + Resting heart rate). Subjects then cycled at that intensity for 15 minutes, paused for 2 minutes to donate blood, before cycling at the same intensity an additional 15 minutes. Blood samples were stained with fluorescent-conjugated antibodies to CD3+, CD56+, CD16+, and CD57+ to identify NK cells and NK cell subsets and analyzed using flow cytometry. The proportion of each cell subset in blood at minute 15 was compared to resting by paired T-tests; the proportion of cells in blood at minute 30 was compared to minute 15 by paired T-tests. **RESULTS:** Relative to rest, the proportion of NK cells at minute 15 was greater (Pre mean=8.27% (standard deviation (SD) 6.31%), 15-min mean =10.34% (SD 7.55%) p=.022). However, the proportion of NK cells at minute 30 did not differ from minute 15 (15-min mean =10.34% (SD 7.55%), 30-min mean= 9.73% (SD 6.99%) p=.125). The proportion of CD16+NK and CD 57+ NK cells did not differ from rest at minute 15, nor did the proportion at minute 30 differ from minute 15 (all p>.05). **CONCLUSION:** These results indicate that 15 minutes of moderate-intensity cycling mobilizes NK cells into the bloodstream, and that there is no further increase in the proportion of NK cells in blood after an additional 15 minutes of cycling. This indicates that a relatively short, moderate-intensity bout of cycling exercise is sufficient to increase the number of these powerful innate immune cells in blood.