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Vascular Function and Physical Activity in Young and Middle-aged Adults

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Cardiovascular risk increases with advancing age and can be attributed to changes in both central cardiovascular function and peripheral microvascular function. Remaining physically active through middle- and older-age may attenuate this risk. **PURPOSE:** Compare central cardiovascular function and peripheral microvascular reactivity between younger (Y) and middle-aged (MA) moderately active adults and determine if differences in physical activity (PA) modify these outcomes. **METHODS:** Twelve apparently healthy, moderately active individuals (n=6 younger) participated in the study. Central cardiovascular function was assessed using cuff-based applanation tonometry on the dominant arm and results were normalized to a heart rate of 75 bpm (AIx75). Microvascular reactivity of the tibialis anterior (TA) muscle was assessed using near-infrared spectroscopy. A cuff was placed on the lower leg distal to the tibiofemoral joint. Baseline data was collected for 2 minutes, after which the cuff was inflated to 250 mmHg for 5 minutes. Microvascular reactivity was calculated as the tissue oxygen saturation (StO₂) reperfusion slope for 10s after cuff release. Sitting time, and time spent walking, and performing moderate or vigorous PA was collected through self-report. **RESULTS:** Analyses indicated no significant main effect of age on AIx75 (10.8 ± 10.47 vs. $6.83 \pm 7.17\%$ in MA and Y, respectively; $p=0.458$). Similarly, there was no significant main effect of age on the StO₂ reperfusion slope (1.59 ± 0.34 vs. $1.45 \pm 0.39\%^{-1}$ in MA vs. Y, respectively; $p=0.524$). Time spent in moderate and vigorous PA was not significantly different between groups ($p=0.896$ and $p=0.346$, respectively), but compared with MA, Y adults reported significantly more time walking (208 ± 157 vs. 118 ± 142 min/day; $p=0.044$) and less time sitting (5.16 ± 2.2 vs. 7.25 ± 2.5 hrs/day; $p=0.015$). Inclusion of walking and sitting time as covariates did not change the results of our microvascular outcomes, but covarying for min/day of walking resulted in significantly lower AIx75 in Y vs. MA adults ($p=0.046$). **CONCLUSIONS:** Differences in microvascular function of the TA muscle are not evident between Y and MA adults who perform similar amounts of moderate and vigorous physical activity, but more time spent walking may contribute lower AIx75 values in younger adults.

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