



Mid Atlantic Regional Chapter of the American College of Sports Medicine

Annual Scientific Meeting, November 2nd - 3rd, 2018
Conference Proceedings
International Journal of Exercise Science, Issue 9, Volume 7



An Examination of Vascular Function Following Acute Exercise in Adults With and Without Sleep Apnea

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Obstructive sleep apnea (OSA) is associated with increased cardiovascular morbidity due, in part, to impaired vascular function. Conversely, vascular function is enhanced following acute exercise. Whether OSA moderates this effect is not known. **PURPOSE:** Examine the conduit and resistance artery function in response to acute exercise in overweight adults with and without OSA. **METHODS:** Participants underwent overnight polysomnography to determine the presence and severity of OSA, as defined by apnea-hypopnea index (AHI). Body fat was analyzed using dual energy X-ray absorptiometry. Vasoreactivity of the brachial artery was measured using flow-mediated dilation (FMD), while microcirculatory function was assessed via the total shear stress area under the curve (SSAUC) response during FMD before completing a 30 minute bout of treadmill exercise (PreEx). Vascular measures were repeated 1H and 2H post exercise. **RESULTS:** Twelve adults (7 men: 5 women) with moderate to severe OSA (+OSA) and twelve adults (8 men: 4 women) with no to mild OSA (-OSA) completed the study. By design, AHI of the +OSA group was higher compared to the -OSA group (29 ± 11 events/hr vs. 8 ± 4 events/hr, $p < 0.01$). At baseline, no differences in age, sex, or total body fat percentage were observed between groups. For FMD, resting arterial diameter and SSAUC, there was no significant time-group interaction, although a trend was present for FMD (+OSA: PreEx: $9.07 \pm 7\%$; 1HR: $4.83 \pm 5\%$; 2HR $6.73 \pm 4\%$; vs. -OSA: PreEx: $6.76 \pm 3\%$; 1HR: $7.45 \pm 3\%$; 2HR $7.97 \pm 3\%$; $p = 0.089$). **CONCLUSION:** We found no substantial difference between the OSA groups in FMD or SSAUC at 1H or 2H, suggesting no adverse or beneficial effects of OSA on vascular function following acute exercise.

Research funded by R15HL133884