EFFECT OF CONTINUOUS-POSITIVE AIRWAY PRESSURE, WEIGHT LOSS OR BOTH ON LARGE ARTERY STIFFNESS IN SUBJECTS WITH OBSTRUCTIVE SLEEP APNEA

Poster Contributions
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Authors: Julio A. Chirinos, Indira Gurubhagavatula, Allan Pack, Karen Teff, Thomas Wadden, Daniel Rader, Gary Foster, Alexandra Hanlon, Greg Maislin, Jesse Chittams, Preston Broderick, Hassam Saif, Raymond Townsend, University of Pennsylvania, Philadelphia, PA, USA

Background: Obesity and obstructive sleep apnea (OSA) have been associated with increased large artery stiffness. We assessed the effects of weight loss, continuous positive airway pressure (CPAP) therapy, or their combination on carotid-femoral pulse wave velocity (cf-PWV), the gold-standard index of large artery stiffness.

Methods: We randomized 139 obese subjects (BMI > 30 kg/m2; mean age = 49.35 years; 57.6% male) with moderate to severe OSA (apnea-hypopnea index ≥ 15 events/hour) to receive: 1) CPAP (n=44); 2) weight loss (n=48); or 3) both (n=47) for 24 weeks. We measured cf-PWV using arterial tonometry at baseline, 8-weeks and 24-weeks after initiation of randomized therapy.

Results: In intent to treat-analyses, no significant changes in cf-PWV were observed in the weight loss arm (change at 24 weeks: -0.04 m/s; 95%CI=-0.55 to 0.47), the CPAP therapy arm (change at 24 weeks: -0.13 m/s; 95%CI=-0.65 to 0.39) or the combination therapy arm (change at 24 weeks: -0.13 m/s; 95%CI=-0.65 to 0.39). There were no significant differences in the change in cf-PWV between the groups. In pre-specified per-protocol analyses restricted to subjects who complied with randomized therapy (at least 5% weight loss or average CPAP use of 4 hours/night throughout the study time period), these results were not appreciably different. The change in mean arterial pressure induced by the intervention was a significant predictor of the change in cf-PWV (P=0.0017). After adjustment for mean arterial pressure and heart rate, no significant changes in cf-PWV were observed in either group, in either intent-to-treat analyses or pre-specified analyses in subjects who met compliance criteria.

Conclusions: In obese subjects individuals with OSA, weight loss, CPAP therapy, or combination therapy for 24 weeks did not appreciably reduce large artery stiffness. It remains to be determined whether more prolonged periods of weight loss and/or CPAP therapy exert favorable effects on large artery stiffness.