

Dr. Ari Shechter

Obstructive sleep apnea syndrome (OSAS) is a sleep-related breathing disorder characterized by recurrent episodes of partial or complete loss of airflow during sleep, resulting in low blood oxygen levels, frequent nocturnal arousals, sleep architecture disruption, and excessive daytime sleepiness. OSAS is associated with a variety of adverse cardiometabolic health outcomes, including hypertension, inflammation, dyslipidemia, insulin resistance, coronary artery disease, and stroke. Obesity is considered the primary risk factor for the development of OSAS, and recently it has been proposed that OSAS may promote further weight gain, placing the two in a vicious cycle. Continuous positive airway pressure (CPAP) is effective in alleviating breathing and sleep abnormalities in OSAS, but it is unclear whether these improvements lead to weight loss and improved cardiometabolic health. The objective of the proposed study is to determine how CPAP treatment affects factors contributing to ideal cardiovascular health, as outlined in the American Heart Association (AHA) 2020 goals. Specifically, the proposed study will utilize a randomized, placebo-controlled, crossover trial to investigate the effects of 2 mo of active CPAP treatment compared to 2 mo of sham CPAP treatment on weight status, physical activity (PA), diet, and cardiometabolic health markers (total cholesterol, blood pressure, fasting plasma glucose) in OSAS patients. Results will therefore help determine if CPAP can improve weight control and cardiovascular health in overweight and obese OSAS patients, and if it can be used as a tool to promote weight loss and ameliorate cardiovascular co-morbidities associated with the disorder and obesity. Measures of free-living PA (accelerometer), food intake (3-d food log), anthropometry, appetite-regulating hormones (leptin, ghrelin, GLP-1), lipid profile, fasting glucose, and inflammatory markers (CRP, TNF α , IL-6) will be taken at baseline and again after 2 mo of nightly use of both active and sham CPAP. At the conclusion of each treatment phase, patients will enter the laboratory for measures of polysomnographic sleep, hunger/appetite levels, and self-selected food intake (ad libitum test meals). Results of the proposed study will be instrumental in the development and implementation of methods to reduce obesity and cardiovascular disease among the many Americans with OSAS, which, consistent with the stated goals of the AHA, will have the effect of improving cardiovascular health and reducing mortality.