



## Letter to the Editor

## Non-exercise activity thermogenesis in obstructive sleep apnea: a pilot study



Dear Editor,

Obesity is the strongest risk factor for obstructive sleep apnea (OSA) [1]. Moreover, mechanisms underlying the bidirectional relationship between obesity and OSA are largely unexplored [2]. The aim of this study was to examine the effects of OSA and continuous positive airway pressure (CPAP) treatment on non-exercise activity thermogenesis (NEAT), the major non-basal metabolic rate (BMR) contributor to energy expenditure [3,4].

Subjects were recruited after an indicated polysomnogram documenting OSA and prior to CPAP treatment. This study was approved by the Institutional Review Board and all subjects provided written informed consent. Baseline measurements included BMR, blood tests, body composition, and NEAT, calculated using a posture and movement system (PAMS) unit [5]. The PAMS unit was applied on seven consecutive mornings after recalibration each day. Subjects commenced CPAP for the subsequent four weeks and wore the PAMS unit again for seven days thereafter, while using prescribed CPAP.

Four middle-aged (mean age  $46 \pm 7$  years) obese (mean BMI  $35.4 \pm 4$  kg/m<sup>2</sup>) CPAP-naïve male subjects with moderate OSA (mean AHI  $21.8 \pm 13.2$ /hour) were studied. Body position and movement were calculated every half-minute using the PAMS device (approximately 1.2 million data points per subject per study period). After CPAP treatment, there was a trend toward an overall increase in NEAT measured in accelerometer units per day ( $p = 0.08$ ) with a significant decrease in time spent sitting ( $p = 0.03$ ). Subjects had increased motion whilst upright and walked faster after CPAP but these were not statistically significant ( $p = 0.15$  and  $p = 0.24$  respectively), which may have been due to the small sample size.

The findings of this pilot investigation, the first of its kind, suggesting a decrease in the time spent sedentary, if replicated in future studies with larger sample sizes have potentially important implications with regard to treatment outcomes for patients with OSA. Results of such experiments may shed light on the mechanisms underlying obesity in OSA and help devise methods for weight loss and increasing physical activity by potentially targeting NEAT.

## Conflict of interest

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The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: <https://doi.org/10.1016/j.sleep.2018.12.008>.

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