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**Title:** Resting energy expenditure in patients with obstructive sleep apnea

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**Body:** Introduction: Obstructive sleep apnea (OSA) may contribute to increases in resting energy expenditure (REE) through hypoxia-related sympathetic activation and hormonal dysregulation. The reports on REE in OSA are scarce, and are confounded by body weight and gender differences. Aim: We assessed REE adjusted for fat-free mass (FFM) in male patients with OSA and hypothesized that REE/FFM ratio is related to indices of OSA severity. Methods: 26 male subjects (age 48.4±11.3 years) evaluated for suspected OSA underwent overnight polysomnography. Body composition was assessed by tetrapolar bioimpedance method and REE by indirect calorimetry. REE/FFM ratio was compared between 16 patients with severe OSA [apnea-hypopnea index (AHI)>30; mean AHI 60.8±20.1 events/hour] and 10 control subjects (AHI<15; mean AHI 10.7±4.4). Results: Patients with severe OSA had increased REE/FFM compared to controls (30.4±3.1 versus 27.3±4.0 kcal/kg/24 h, p=0.033). In univariate analyses, REE/FFM was directly related to AHI, oxygen desaturation index (ODI) and arousal index (R=0.486, p=0.012; R=0.561, p=0.003; R=0.482, p=0.013, respectively). In multivariate analysis, only ODI remained an independent predictor of REE/FFM after adjustments for age, body mass index, AHI and arousal index (p=0.027, R<sup>2</sup>=0.438). Conclusion: Resting metabolic rate was increased in patients with severe OSA and correlated with indices of OSA severity. The independent predictive value of ODI suggests a possible role for intermittent hypoxia in the regulation of energy metabolism in OSA. Support: APVV-0134/11, VEGA 1/0111/12, 8/GSD/2011, Slovakia.