Abstract: P4520

APAP therapy does not improve impaired sleep quality and sympatho-vagal balance: a randomized trial in patients with obstructive sleep apnea and systolic heart failure

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Introduction and purpose: In heart failure with reduced ejection fraction (HFrEF), the effects of automatic positive airway pressure therapy (APAP) for obstructive sleep apnea (OSA) on sleep quality and sympatho-vagal balance (SVB) are unknown.

Methods: In this randomized controlled trial, sleep quality and SVB in patients with HFrEF and OSA were monitored noninvasively across different breathing conditions (5-minute segments of OSA or normal breathing [NB]) during stable N2 sleep) at baseline (T0), during APAP initiation (T1) and after 6 months of successful APAP treatment (T2).

Results: 75 patients (61 male, 65±12 years, LVEF 31±9%) were enrolled. OSA was associated with a 17% increase in the low frequency/high frequency component ratio of heart rate variability (LF/HF) versus baseline, suggesting an increase in sympathetic drive (SVB) with OSA compared with normal breathing at baseline. Respiratory indices and oxygen saturation all significantly improved at both T1 and T2, but 6 months’ APAP had no clinically relevant effect on objective sleep quality versus control. In HFrEF patients -suitable for HRV analysis (n=23)-, there was a trend (p=0.097) towards an increase in LF/HF at T2 in the therapy group (+17%), suggesting increased SVB.

Conclusion: Treatment of OSA in systolic HF patients improves respiratory indices but has no favorable effect on sleep quality. While OSA per se was associated with an increase in sympathetic drive, APAP treatment was not associated with a desired reduction in sympathetic drive. There was even a trend towards additional increases in sympathetic drive during the entire night and N2 sleep in particular.