

## Sleepiness and Sleep in Patients With Both Systolic Heart Failure and Obstructive Sleep Apnea

Michael Arzt, MD; Terry Young, PhD; Laurel Finn, MS; James B. Skatrud, MD<sup>†</sup>; Clodagh M. Ryan, MD; Gary E. Newton, MD; Susanna Mak, MD; John D. Parker, MD; John S. Floras, MD, DPhil; T. Douglas Bradley, MD

*Arch Intern Med.* 2006;166:1716-1722.

**Background** Adverse effects of obstructive sleep apnea (OSA), including sleep deprivation, can contribute to the progression of heart failure. The usual indication to diagnose and treat sleep apnea is subjective sleepiness. Previous studies suggest that patients with both heart failure and obstructive sleep apnea often do not complain of sleepiness, albeit their sleep time may be reduced. Therefore, we tested the hypothesis that patients with heart failure have less sleepiness and sleep less compared with subjects without heart failure for a given severity of OSA.

**Methods** Sleepiness assessed with the Epworth Sleepiness Scale and sleep structure measured with polysomnography were compared among 155 consecutive patients with heart failure and from a random community sample ( $n = 1139$ ) according to categories of the apnea-hypopnea index ( $<5$ , no OSA; 5-14, mild OSA; and  $\geq 15$ , moderate to severe OSA).

**Results** Compared with the community sample, for any given severity of OSA, patients with heart failure had lower mean  $\pm$  SE Epworth Sleepiness Scale scores ( $7.1 \pm 0.4$  vs  $8.3 \pm 0.2$  [ $P = .005$ ];  $6.7 \pm 0.7$  vs  $9.2 \pm 0.3$  [ $P < .001$ ]; and  $7.8 \pm 0.7$  vs  $9.8 \pm 0.4$  [ $P = .01$ ]), indicating less sleepiness despite sleeping less (total sleep time mean  $\pm$  SE [in minutes]:  $306 \pm 7$  vs  $384 \pm 2$ ,  $295 \pm 19$  vs  $384 \pm 5$ , and  $285 \pm 13$  vs  $359 \pm 7$  for no, mild, and moderate to severe OSA, respectively;  $P < .001$  for all comparisons).

**Conclusions** Patients with heart failure have less subjective daytime sleepiness compared with individuals from a community sample, despite significantly reduced sleep time, whether or not they have OSA. In patients with heart failure, the absence of subjective sleepiness is not a reliable means of ruling out OSA.

**Author Affiliations:** Sleep Research Laboratory of the Toronto Rehabilitation Institute, the Center for Sleep Medicine and Circadian Biology (Drs Arzt, Ryan, and Bradley) and Division of Cardiology, Department of Medicine, Mount Sinai Hospital (Drs Newton, Mak, Parker and Floras), University of Toronto, Toronto, Ontario; and Departments of Population Health Sciences (Dr Young and Ms Finn) and Medicine (Dr Skatrud), University of Wisconsin School of Medicine and Public Health, Madison. <sup>†</sup> Deceased.