



## Sleep apnea in heart failure

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**TO THE EDITOR:** In their excellent article, Wexler and Javaheri<sup>1</sup> reviewed in detail the relationship between sleep apnea and heart failure.

I would like to emphasize the association between obstructive sleep apnea and diastolic heart failure. Nearly 50% of patients presenting with signs and symptoms of heart failure have a normal left ventricular systolic ejection fraction, and for these patients diastolic abnormalities in the left ventricle have been demonstrated.<sup>2</sup> As the authors comment, researchers have reported a prevalence of obstructive sleep apnea in diastolic heart failure patients much greater than that in the general community.<sup>3</sup> Importantly, obstructive sleep apnea has recently been identified as an independent risk factor for developing left ventricular diastolic dysfunction, and nasal continuous positive airway pressure therapy has shown beneficial effects on left ventricular diastolic parameters.<sup>4</sup>

In view of the aforementioned data, the diagnosis and treatment of this primary sleep disorder might prevent the development of heart failure symptoms in many patients with sleep apnea. Indeed, a careful search for sleep apnea symptoms should be performed in patients with diastolic heart failure in order to correctly treat this sleep disorder, helping to improve the left ventricular diastolic function.

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Obstructive sleep apnea syndrome affects left ventricular diastolic function: effects of nasal continuous positive airway pressure in men. *Circulation* 2005; 112:375–383.

**IN REPLY:** We thank Dr. Arias for his comments, with which we are in full agreement. When our review article<sup>1</sup> was accepted by the *Journal*, the report by Dr. Arias and colleagues<sup>2</sup> had not yet been published.

Much research on the prevalence, pathophysiology, and impact of sleep apnea in systolic heart failure has been published<sup>1,3,4</sup>; in contrast, very limited data are available in diastolic heart failure. However, as emphasized in our review article and in the study by Arias and colleagues, obstructive sleep apnea should be considered perhaps as a cause and/or a contributory factor in the development of diastolic heart failure. Multiple obstructive sleep apnea-related mechanisms such as nocturnal and diurnal systemic hypertension, nocturnal hypoxemia,<sup>4</sup> and perhaps neurohormonal factors may be involved.

From an epidemiological point of view, it is important to appreciate that the prevalence of both obstructive sleep apnea and diastolic heart failure increases with aging and, as emphasized by Dr. Arias,<sup>2</sup> treatment of obstructive sleep apnea improves left ventricular diastolic function. However, further research in this area is needed.

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