Screening for Sleep-Disordered Breathing in Patients Hospitalized for Heart Failure*

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Sleep-disordered breathing (SDB) represents a highly prevalent comorbidity in heart failure (HF) patients. Approximately 45% of stable patients with either heart failure with reduced ejection fraction (HFrEF) or preserved ejection fraction have moderate to severe obstructive sleep apnea (OSA) or central sleep apnea (CSA) (1,2), and this prevalence is even greater in patients with acutely decompensated heart failure (ADHF) (3). Although OSA was identified as an independent risk factor for the development of HF (4), CSA with Cheyne-Stokes respiration is usually attributed to the pathophysiology of severe systolic dysfunction. Several observational studies suggest that effective treatment of SDB in HF may translate into improved quality of life, cardiac function, and even survival (5–10). These studies suggest that cardiologists need to be prepared to screen, diagnose, and even treat SDB in HF patients.

In this context, the study by Sharma et al. (11), in this issue of JACC: Heart Failure, provides a possible clinical pathway to screen for and finally diagnose and treat SDB in HF patients. Patients admitted for ADHF were pre-screened for SDB by a simple questionnaire (STOP-BANG [questionnaire of heavy snoring, tiredness, observed apneas, hypertension, body mass index >35 kg/m², age >50 years, neck circumference >40 cm, and male sex]). Acknowledging that this was a small, single academic tertiary care center study, it remains impressive that 87% of the 282 patients admitted with ADHF were classified as high risk for SBD. Those with positive screening results were offered in-hospital screening for SDB using overnight photoplethysmography. The main metric of photoplethysmography screening for SDB represents the oxygen desaturation index, which counts the number of oxygen desaturations of at least 4%. Because oxygen desaturations predominantly result from apneic or hypopneic respiratory events, the oxygen desaturation index was compared with the apnea-hypopnea-index obtained during full outpatient polysomnography performed within 4 weeks after discharge from the hospital.

This approach to address the important comorbidity of SBD in patients with HF was promising in the population studied and has some significant advantages. Patients admitted with HF represent a “captive population,” and this in-hospital period can be leveraged to perform these diagnostic screening tests. Thus, a simple overnight in-hospital photoplethysmography might be 1 method to screen for SDB in HF.

However, there are some additional considerations for this study. With a pre-test probability of more than 50%, one might argue whether pre-screening is of any additional benefit in this patient population. A patient’s history, symptoms, and even questionnaire results do not identify or exclude SDB in an HF population with high sensitivity or specificity (12,13). By pre-screening HF patients using the STOP-BANG questionnaire (recalling that it is not a properly validated instrument), there might be a nonspecific bias in patient selection for further screening. We agree that whichever screening method is used, it needs to be validated against the gold standard of polysomnography. Additionally, the competing risk of evaluating the patient prematurely in the context of persistent decompensated HF and the imperative to

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rapidly discharge the patient may confound the implementation of such screening in some health care systems. Furthermore, the recent preliminary results of the SERVE-HF (Treatment of Predominant Central Sleep Apnoea by Adaptive Servo Ventilation in Patients With Heart Failure) trial (NCT00733343) (14), a study of the effects of adaptive servo-ventilation (ASV) in patients with HFrEF, suggest that ASV is not beneficial, specifically in patients with CSA and HFrEF. These results may limit the applicability of this diagnostic pathway, but we encourage clinicians to await the full published results of this important trial as well as additional studies in patients with stable HFrEF with CSA and OSA (ADVENT-HF [Effect of Adaptive Servo Ventilation (ASV) on Survival and Hospital Admissions in Heart Failure], NCT01288816) and in ADHF (CAT-HF [Cardiovascular Improvements With MV ASV Therapy in Heart Failure], NCT01953874). Physicians need to recall that OSA is a common comorbidity in patients with HF and still represents an appropriate therapeutic target.

In summary, we congratulate Sharma et al. (11) for an innovative pathway to screen for SDB in HF and the integration of SDB into cardiology. There might be various pathways and methods to screen for, diagnose, and even treat SDB in cardiac patients. These pathways and methods may vary from continent to continent, from country to country, and even from hospital to hospital, but it is about time to seriously think about those pathways and to establish them within cardiology.

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