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Detection of Sleep Disordered Breathing in Patients Hospitalized with Congestive Heart Failure

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Editorial

Congestive Heart Failure (CHF) is the most common cause of hospital admissions in the United States [1]. It costs over 32 billion per year in health care services, medication and missed days at work in United States alone [2]. An estimated 20 percent of Centers of Medicare and Medicaid Services (CMS) beneficiaries are readmitted to the hospital within 30 days of discharge. Recently The Patient Protection Affordable Care Act (ACA) of 2010 has implemented a new rule to reduce CHF readmissions, in which, from 2015 onwards, hospitals with high readmissions rates can lose $\leq 3\%$ of their Medicare reimbursement [3].

Sleep Disordered Breathing (SDB) is a common disorder in CHF patients, with a prevalence of 50-70% [4]. Despite high prevalence the awareness of this co-morbid condition is quite low. A study on CMS patients by Javaheri et al. revealed that only 2% of the patients with CHF are diagnosed and treated for SDB [5].

Apart from low awareness, the fact that most CHF patients with SDB do not demonstrate classical subjective symptoms of excessive daytime sleepiness has not helped the cause [6]. Costly Polysomnography (PSG) testing may also deter referring cardiologists to take a call on nebulous grounds.

SDB, especially OSA, can significantly impact patients with CHF [7]. It has been demonstrated that men with severe OSA have a 58% higher adjusted risk of incident heart failure than men without OSA [8]. Studies have shown that untreated OSA can worsen CHF and treatment of SDB results in improvement of ejection fraction [9]. A recent study showed that early intervention and treatment of SDB in CHF patients is associated with reduction in 30-day admissions in CHF patients [10].

The critical interventions, which may make a difference, would be 1) to consider the diagnosis of SDB in all patients admitted for CHF and 2) have a simple objective but cost effective test to risk stratify them.

Although data shows that screening questionnaires do not work in patients with CHF suspected to have SDB [11]. Our data suggests that STOPBANG questionnaire helps improving the awareness of the physician/team taking care of the patient. Our hospital Sleep Medicine program monitored the impact of screening and education of the house staff. We tracked the number of consults prompted by the positive screen to versus consults ordered directly by the admitting team. As noted in the figure, the ratio of direct consults as opposed to screen prompted consults significantly improved over time. The high-resolution Plethysmography (HRPO) however, may be a game changer

in implementing a cost effective strategy for effective screening of SDB in CHF patients [12].

HRPO is a significant advancement from prior generation pulse-oximeters. Its ability to record signals with averaging time of 1-2 seconds and appropriate filters for artifacts makes it a highly sensitive and specific tool for screening of SDB in hospitalized patient. HRPO is also simple to use and can be applied in the hospital setting with minimal training of respiratory therapists or floor nurses. Oxygen desaturation index (usually set to capture 4% desaturation to align with CMS criteria) of >5 , was found to be a reliable cut-off for determining risk for OSA in our study. In addition, the study also provides information on degree of desaturation and severity of apneic events, which may help with prognostication as well decision on urgency of intervention.

In conclusion, SDB has significant impact on patients with CHF and strategies for increased awareness, early detection, cost effective screening in hospitalized patients "captive audience" may pay rich dividends in the management of heart failure.

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