The Yin and Yang of dyspnea in the emergency department: heart failure or COPD?

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Dear Editor,

In a recent issue of your journal, we were grateful to read the enjoyable article by Caram et al. (1), which evaluated the prevalence of electrocardiographic and echocardiographic abnormalities in patients with chronic obstructive pulmonary disease (COPD) according to disease severity (25 mild/moderate and 25 severe/very severe COPD patients). The study showed that COPD patients have a high prevalence of left ventricular diastolic dysfunction (LVDD) and that this dysfunction is associated with disease severity. The authors also concluded that because of this close association, it is important to exclude decompensated heart failure (HF) during the evaluation of COPD exacerbation.

Heart failure and COPD are the most common causes of mortality worldwide (2). The two diseases have significant overlap with regard to risk factors and pathophysiological mechanisms (including systemic inflammation), resulting in diagnostic and therapeutic challenges for both emergency department and outpatient physicians (3,4). Approximately 10–40% of patients with HF have reported concomitant COPD (3). Additionally, the prevalence of unrecognized HF was 20.9% in patients with COPD or asthma presenting to the emergency department (5), and this prevalence was reported as 20.5 and 17% in community patients with stable COPD (6,7). In addition to the similarity in mechanism, both conditions may present with highly similar symptoms, including dyspnea, orthopnea, coughing, exercise intolerance, fatigue, muscle weakness, disturbed sleep, anorexia, and anxiety (8). Caram et al. (1) noted that patients with COPD have significant echocardiographic abnormalities, independent of disease severity (98%). The most frequently noted echocardiographic abnormality was mild LVDD (88%). Of the several studied risk factors, COPD severity was the only significant predictor of LVDD, which might explain the common pathophysiological pathways in both conditions. However, this association should be coupled with follow-up data demonstrating that the concurrent presence of HF and COPD can increase morbidity and mortality. The findings of Caram et al. (1) demonstrated that HF and COPD are common and frequently concomitant conditions in patients with COPD that can be screened for using transthoracic echocardiography, an acceptable, safe, valid, and reliable imaging modality applicable to the COPD population. In addition to imaging techniques, concurrent HF and COPD exacerbations can be differentiated by biochemical tests, including natriuretic peptides (such as brain natriuretic peptide). Natriuretic peptides provide additional diagnostic accuracy and might be the most effective tool in refining the diagnosis for this patient population, given the high negative predictive value of a normal result. However, through the effects on pulmonary artery pressure and right-ventricular overload, COPD can also cause elevated circulating levels of natriuretic peptides (9,10). Despite this potential confounding factor, the negative predictive accuracy of natriuretic peptides for ruling out acute decompensated HF appears to be preserved, even in cohorts of patients with both HF and COPD diagnoses (5,11).

In conclusion, this study demonstrated that patients with COPD have significant electrocardiographic and echocardiographic abnormalities, independent of disease severity. Among all of the pathological findings, LVDD is of great importance because of the prognostic role it plays in patients with COPD. As diagnosing cardio-pulmonary interaction is a complex process, LVDD in COPD patients can be best addressed through simple clinical measures, including natriuretic peptides and objective measurements of ventricular dysfunction by echocardiography.

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No potential conflict of interest was reported.

DOI: 10.6061/clinics/2013(09)18

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