

The impact of a chronic obstructive pulmonary disease diagnosis on the identification of heart failure

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Chronic obstructive pulmonary disease (COPD) and heart failure (HF) frequently coexist, complicating the diagnostic process due to overlapping symptoms and pathophysiological mechanisms. Distinguishing between the two conditions is critical for appropriate management but remains a significant challenge for clinicians.

The aim was to study the impact of COPD diagnosis on the detection of HF in patients with breathlessness and investigate the clinical and echocardiographic parameters identifying HF patients (P) with concomitant COPD.

Methods: 68 P with previously diagnosed COPD on optimal therapy (based on GOLD 2024 guidelines) were included in the study. The control group included 26 patients with newly established HF without COPD (HF). All patients underwent general clinical examination, the MRC dyspnea scale, calculated body mass index (BMI), echocardiography, spirometry, and measurements of the NT-proBNP. After investigation, we compare data in 3 groups: I-37 P with COPD without HF; II-26 P with COPD+HF, III-26 P with HF.

Results: Among P with COPD, only 12 (18 %) had a previously established HF diagnosis. After our investigation, HF was detected in 26 (38 %) of them. The prevalence of HF with preserved EF was 45% in GOLD stage 2, 40 % in stage 3, and 15% in stage 4. Whereas individuals with HF without COPD had a higher prevalence of HF with reduced EF (34% vs. 23%). The mMRC grade was significantly higher in group II (COPD+HF) than in groups I and III ($P<.01$, $P<.05$).

In P with COPD+HF, the NT-proBNP was significantly higher than in HF ($1102,26\pm31$ and 976 ± 21 pg/mL, respectively; $P<.05$). In patients with COPD+HF was observed a correlation between the MRC dyspnea grade and E/e' ratio ($r = 0.44$, $P<.01$), NT-proBNP and E/e' ($r = 0.38$, $P<.05$), left ventricular ejection fraction (LVEF) ($r = -0.37$, $P<.05$), left atrium volume (LA) ($r = 0.34$, $P<.05$), BMI ($r = 0.34$, $P<.05$), and right ventricular size (RV) ($r = 0.38$, $P<.05$). In patients with COPD was a correlation between NT-proBNP and TR velocity ($r = -0.43$, $P<.05$) and right ventricular size (RV) ($r = 0.38$, $P<.05$). By multivariate analysis older age, obesity, the MRC dyspnea grade (≥ 3), E/e' ratio ($>13,5$) were associated with the diagnosis of HF in COPD patients (0.38, $P<.01$; 0.41, $P<.01$; 0.67, $P<.001$; 0.41, $P<.01$; respectively).

Conclusion: The prevalence of unrecognized HF in symptomatic COPD patients turned out to be 20 %, particularly in severe stages (GOLD 3 or 4) underscores the need for routine cardiac evaluation in this population. NT-proBNP levels can be unexpectedly higher in COPD patients due to right ventricular strain and pulmonary hypertension, in the absence of left-sided heart failure making echocardiography essential for accurate diagnosis. Among patients with COPD, HF with preserved EF is the most common. The higher mMRC grade (≥ 3), older age, obesity, E/e' ratio ($>13,5$) predict hidden HF in COPD with persistent symptoms despite optimal COPD treatment.