

Multicenter Study

[Int J Chron Obstruct Pulmon Dis](#). 2024 Aug 1:19:1767-1774.

doi: [10.2147/COPD.S447819](https://doi.org/10.2147/COPD.S447819). eCollection 2024.

Value of Lung Ultrasound Sonography B-Lines Quantification as a Marker of Heart Failure in COPD Exacerbation

Fadwa Lajili ^{1 2}, Marwa Toumia ^{1 2}, Adel Sekma ^{1 2}, Khaoula Bel Haj Ali ^{1 2}, Sarra Sassi ^{1 2}, Asma Zorgati ³, Hajer Yaakoubi ³, Rym Youssef ³, Mohamed Habib Grissa ^{1 2}, Kaouther Beltaief ^{1 2}, Zied Mezgar ⁴, Mariem Khrouf ⁴, Ikram Chamtour ⁵, Wahid Bouida ^{1 2}, Hamdi Boubaker ^{1 2}, Mohamed Amine Msolli ^{1 2}, Zohra Dridi ⁶, Riadh Boukef ^{1 3}, Semir Nouira ^{1 2}

Affiliations [expand](#)

PMID: 39108664 PMCID: [PMC11300558](#) DOI: [10.2147/COPD.S447819](https://doi.org/10.2147/COPD.S447819)

Abstract

Introduction: Identifying heart failure (HF) in acute exacerbation of chronic obstructive pulmonary disease (AECOPD) can be challenging. Lung ultrasound sonography (LUS) B-lines quantification has recently gained a large place in the diagnosis of HF, but its diagnostic performance in AECOPD remains poorly studied.

Purpose: This study aimed to assess the contribution of LUS B-lines score (LUS score) in the diagnosis of HF in AECOPD patients.

Patients and methods: This is a prospective cross-sectional multicenter cohort study including patients admitted to the emergency department for AECOPD. All included patients underwent LUS. A lung ultrasound score (LUS score) based on B-lines calculation was assessed. A cardiac origin of dyspnea was retained for a LUS score greater than 15. HF diagnosis was based on clinical

examination, pro-brain natriuretic peptide levels, and echocardiographic findings. The LUS score diagnostic performance was assessed by receiver operating characteristic (ROC) curve, sensitivity, specificity, and likelihood ratio at the best cutoffs.

Results: We included 380 patients, mean age was 68 ± 11.6 years, sex ratio (M/F) 1.96. Patients were divided into two groups: the HF group [$n=157$ (41.4%)] and the non-HF group [$n=223$ (58.6%)]. Mean LUS score was higher in the HF group (26.8 ± 8.4 vs 15.3 ± 7.1 ; $p < 0.001$). The mean LUS score in the HF patients with reduced LVEF was 29.2 ± 8.7 , and was 24.5 ± 7.6 in the HF patients with preserved LVEF. LUS score area under ROC curve for the diagnosis of HF was 0.71 [0.65-0.76]. The best sensitivity (89% [85.9-92.1]) was observed at the threshold of 5; the best specificity (85% [81.4-88.6]) was observed at the threshold of 30. Correlation between LUS score and E/E' ratio was good ($R=0.46$, $p=0.0001$).

Conclusion: Our results suggest that LUS score could be helpful and should be considered in the diagnostic approach of HF in AECOPD patients, at least as a ruling in test.

Keywords: COPD; chronic obstructive pulmonary disease; dyspnea; heart failure; lung ultrasound sonography.

© 2024 Lajili et al.

[PubMed Disclaimer](#)