gradient of distribution (gravitational/irregular) of vertical artifacts, as well as features of the pleural line (rough/smooth/thickened), with a standardized probe setting are pivotal in better defining B-lines, so we believe that a new approach, and not just a simple count, should be identified in order to guide clinicians to correct diagnosis and treatment.

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REPLY: B-Lines: a Nonspecific but Highly Informative Sign of Pulmonary Congestion

Dr. Zanforlin, Dr. Trovato, and colleagues have raised some issues about our study (1) that we are glad to address.

As mentioned in the paper, the lack of specificity of B-lines is well recognized (2). Our study group was selected so that no patient had a clinical condition apart from pulmonary congestion that was likely to cause the detection of B-lines. Many signs that we routinely use in clinical practice are not specific; as physicians, we should always contextualize B-lines, as well as other biomarkers, in the overall clinical picture. Of course, if we consider patients with other pulmonary diseases that involve the lung interstitial space, the usefulness of B-lines as a sign of extravascular lung water (EVLW) decreases. We would not advise the use of B-lines to help in differentiating hemodynamic from pulmonary congestion in these subsets of patients.

We agree that evaluation of B-lines can include much more than a simple semiquantitative estimation and we believe that the assessment of the pleura and subpleural features may offer important information (2). In our study group of outpatients with heart failure and no significant pulmonary comorbidity, we considered this limited analysis to provide an acceptable level of information. Counting B-lines is an attempt to enrich a finding that, in our view, is not just dichotomous. Although it is a rough semiquantification, rather than an accurate quantification, it nonetheless correlates with clinical, radiological, and invasive signs of EVLW, including gravimetric estimation (3). Moreover, B-lines have clear prognostic implications (4), even in this specific group (5). We will be glad to utilize a more accurate way to quantify B-lines, as soon as it becomes available.

We scanned most patients supine, limiting our evaluation to the anterolateral chest, as in most B-line studies. Because of the short time the patients were lying down, we believe this did not significantly change EVLW distribution from the orthostatic position. We agree, nevertheless, that in outpatients, it is reasonable to scan the posterior basal regions (dependent zones).

One of the advantages of evaluating B-lines is that their assessment is not strictly dependent on 1 specific probe. The convex or microconvex probes seem to be the most appropriate. However, we do not believe that we should give up the meaningful information we get in our everyday practice from lung ultrasound, just because we do not have the perfect probe at hand. The Bland-Altman plots showed a very low bias between probes, as well as for interobserver and intraobserver agreement (6).

We accept the criticism that there are no data on titrating treatments according to B-lines (2), nor studies on cost effectiveness. In our paper, we only briefly speculate about the potential tailoring of pharmacological therapy according to B-lines, as a possible clinical implication. A prospective, randomized trial on dialysis patients with heart failure, comparing a standard approach with that of B-line-driven therapy, is in progress (2).

We fully share the concern of improving the reliability and objectivity of imaging, as well as the scientific pathway to promote them. This is why we are trying to deepen our knowledge on this relatively new ultrasound application that, according to many authors, is very promising.

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