A correlation was found between LGE presence and Holter ECG ventricular arrhythmias (chi-square test = 9.5; $p < 0.01$). Patients with ventricular arrhythmias also showed a greater amount of LGE at quantitative analysis (2.6 ± 2.1 g vs. 1.2 ± 1.5 g; $p < 0.01$). No other clinical characteristic was able to discriminate between patients with presence and/or amount of LGE.

To the best of our knowledge, this is the largest SSc group evaluated for the complementary role of CMR and echocardiography in detecting early cardiac involvement. We found that LGE is frequent in patients with SSc, irrespective of symptoms, and is linked to ventricular arrhythmias at Holter ECG. This finding may have relevant clinical implications, underlining the role of fibrosis as a potential trigger for arrhythmias. The high percentage of patients with LGE among those who have a positive Holter ECG suggests a role for Holter ECG as a possible gatekeeper for CMR. Although recommendations support CMR to refine the clinical suspicion of myocardial involvement when TTE is inconclusive (2), the lack of predictive TTE abnormalities in our group of patients makes the selection of patients who may benefit of CMR challenging when this selection is based only on TTE. About 30% of our patients showed LGE at right ventricular insertion sites. It may be argued that LGE at this localization can be related to expanded extracellular space, rather than to replacement fibrosis, possibly linked to pulmonary parenchymal and/or vascular involvement, although these differences were not significant in our group of patients. Its clinical value will remain uncertain until it can be clearly linked to prognostic data (3).

A small proportion of patients, although asymptomatic, had CMR signs of myocardial edema that was reversible after steroid therapy. Subclinical myocarditis is frequent in SSc (4), but it may be argued whether it is worth treating. In our experience, prompt pharmacological therapy led to complete resolution of CMR signs of myocardial edema (5), but as with LGE, only prognostic data can fully clarify this aspect.

The lack of T1 mapping analysis is a limitation of the present study. As soon as the technique was available in our laboratory, we evaluated T1 mapping in a subgroup of this group of patients; it showed that myocardial extracellular volume fraction was significantly increased in patients with SSc with normal biventricular volumes and systolic function, compared with control subjects (6).

In conclusion, CMR can detect frequent subclinical SSc-related cardiac involvement, which is linked to ventricular arrhythmias. Prognostic data are needed to clarify the long-term clinical implications of these imaging abnormalities.

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The Functional Meaning of B-Profile During Stress Lung Ultrasound

The B-Profile of normal lung sliding with B-lines by lung ultrasound (LUS) identifies pulmonary congestion at rest and during exercise stress echocardiography (SE) in coronary artery disease (CAD) (1) or heart failure (HF) patients with either reduced (2) or preserved (3) resting left ventricular ejection fraction (EF).

We hypothesized that patients developing B-lines during physical or pharmacological SE are likely to have a functional ischemic or extra-ischemic cause of vulnerability to interstitial pulmonary edema, which can be unmasked with simultaneous transthoracic echocardiography (TTE).

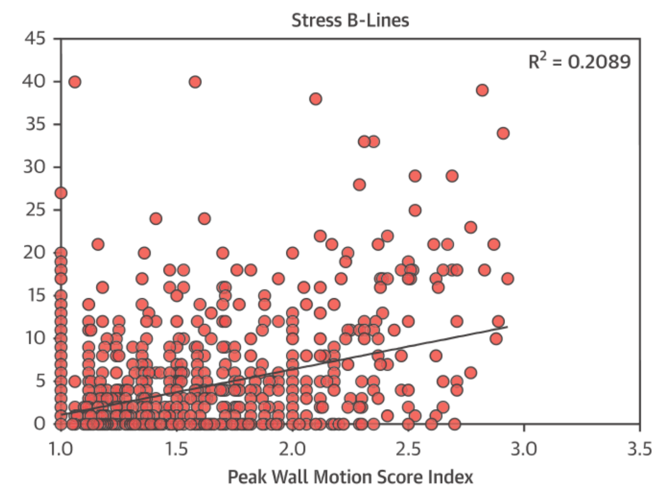
In this prospective study, we evaluated 2036 patients (727 females and 1,309 males; age 63 ± 11 years; EF 58 ± 11%) with known or suspected CAD and/or HF recruited by 21 accredited laboratories of 8 countries (Argentina, Bulgaria, Brazil, Hungary, Italy, Poland, Russian Federation, and Serbia) of the SE 2020 study network (4). Exclusion criteria were severe arrhythmias or valvular or congenital heart disease evaluated based on clinical records and resting TTE before the enrollment. Of recruited patients, 780 (38%) had previous coronary revascularization procedure, 519 (25%) had previous myocardial infarction, 312 (15%) had history of dyspnea, and 142 (7%) had chronic obstructive pulmonary disease. The employed stress was exercise in 1167 (semi-supine, n = 812; upright bicycle, n = 348; post-treadmill, n = 7) or pharmacological testing in 869 patients (dipyridamole, n = 709; dobutamine, n = 150; adenosine, n = 10). The same cardiac transducer was used for TTE and LUS. We adopted the 4-site simplified scan (3,4), from midaxillary to mid-clavicular lines on the third intercostal space. The positivity criterion for B-lines ("wet lung") was a stress score higher than rest for ≥2 points.

Non-parametric Spearman coefficient was used to assess linear correlation. Multivariate logistic regression analysis was performed to find predictors of any appearance or increment in stress B-lines. Statistical significance was set at $p < 0.05$.

Interpretable images were obtained in all patients. Regional wall motion abnormalities (RWMA) were present in 483 patients (24%). A "wet lung" was present in 512 patients (25%). Ischemic heart with wet lung was present in 213 patients (11%).

Peak Wall Motion Score Index (WMSI) was correlated with B-lines ($R = 0.46$; $p = 0.001$) (Figure 1). At multivariate logistic regression analysis, stress WMSI (odds ratio [OR]: 4.89; 95% confidence interval [CI]: 3.65 to 6.55; $p < 0.001$), peak systolic blood pressure (OR: 1.008; 95% CI: 1.004 to 1.011; $p < 0.001$), severe mitral regurgitation (OR: 2.38; 95% CI: 1.03 to 5.54; $p < 0.001$), systolic pulmonary arterial pressure >40 mm Hg (OR: 4.94; 95% CI: 1.41 to 17.32; $p < 0.012$), hypertension (OR: 1.36; 95% CI,

FIGURE 1 **Wet Lung and Regional Wall Motion Abnormalities During Stress**



The correlation between peak wall motion score index (x-axis) and stress B-lines (y-axis) in the entire population.

1.04 to 1.79; $p < 0.024$), and history of dyspnea (OR: 1.37; 95% CI: 0.98 to 1.92; $p = 0.066$) were associated with B-lines during SE. Stress E/e' >15 was more frequent in wet lungs (44 vs. 14%; $p < 0.001$) but not significant at multivariate analysis. Stress B-lines' appearance or increment was present in 3 of 27 patients with no CAD (11%), 5 of 26 (19%) with single-, 8 of 22 (36%) with double-, and 15 of 27 (55%) with triple-vessel disease ($p = 0.003$ for trend test).

Dual imaging TTE-LUS during SE is feasible and simple, with 100% success rate and only minimal increase of imaging time. Stress B-lines are associated with more severe and/or extensive RWMA and CAD. In patients without inducible ischemia, stress B-lines are associated with severe mitral insufficiency, increased pulmonary pressure, and excessive systolic blood pressure increase during stress. The same probe was used for TTE and LUS and this may lower the image quality but does not affect to any significant extent B-lines quantification. B-lines also originate from pulmonary interstitial fibrosis, but these fibrotic B-lines do not increase during stress. During stress, B-lines are simpler to image and to measure, not degraded by hyperventilation and tachycardia, and inherently more quantitative than RWMA.

The integration of TTE and LUS identifies a spectrum of functional responses ranging from non-ischemic heart and dry lung up to very abnormal ischemic heart and wet lung, with all intermediate responses in between. (A full listing of the members of the Stress Echo 2020 study group can be found at the web site (5). Please note that these are members of the Stress Echo study group and not coauthors of this letter.)

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Characterization of 18-Fluorodeoxyglucose Uptake Pattern in Infective Endocarditis After Transcatheter Aortic Valve Implantation

Diagnosis of prosthetic valve infective endocarditis (IE) is challenging because sensitivity of Duke Criteria is low, ranging from 52% to 70% (1). Therefore, fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) was included in the modified Duke Criteria to improve their sensitivity. The European Society of Cardiology guidelines (1) recommend performing FDG-PET/CT 3 months after cardiac surgery to reduce the risk of false-positive results related to post-operative inflammatory process (2,3). However, the accuracy of FDG-PET/CT was mainly validated in patients with surgical prostheses, whereas limited data exist for IE related to transcatheter aortic valve implantation (IE-TAVI) (4). The aim of the study was to describe the physiological FDG uptake after TAVI in controls and cases with IE-TAVI suspicion.

The study prospectively included 45 consecutive patients who underwent FDG-PET/CT after TAVI. Median age was 85 years (range, 82 to 88 years), most patients were men (54%), and median comorbidity Charlson Index was 5 (range, 4 to 7). The population was divided in two groups. The control group ($n = 31$) underwent FDG-PET/CT at 1 and 3 months after TAVI if the first one was positive. The endocarditis group ($n = 14$) included patients with a suspicion of IE-TAVI. The two groups had similar baseline characteristics. Diagnosis (including the FDG-PET/CT results) was determined by the endocarditis team after a 3-month follow-up. Written consent was obtained from all patients.

Patients followed a low-carbohydrate diet to limit myocardial uptake before FDG-PET/CT. Patients with persisting myocardial uptake compromising the valvular analysis were excluded. Positive valvular uptakes were analyzed from axial views and categorized as: 1) focal for a single uptake <25% of the valve circumference; 2) hemi-circumferential when the uptake ranged between 25% and 75%; and 3) circumferential when the uptake was >75%. Multifocal