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Using high-resolution computed tomography to detect interstitial lung disease in patients with systemic sclerosis: comment on the concise communication by Bernstein et al

To the Editor:

We read with interest the concise communication by Bernstein et al (1) regarding practice patterns among rheumatologists when screening for interstitial lung disease (ILD) in patients with systemic sclerosis (SSc). Referencing the study by Suliman et al (2), the authors state that pulmonary function tests (PFTs) are not sensitive or specific for detecting ILD in this population. The primary message in that study (2) is that PFTs yield a false-negative rate of 62.5% for early detection of ILD in SSc when high-resolution computed tomography (HRCT) is used as the gold standard. It is important to note, however, that the primary measurement used to define baseline abnormality in the study by Suliman and colleagues was forced vital capacity (FVC) <80% of predicted. As already pointed out by Degano et al (3), the incorporation of other measures, including diffusing capacity for carbon monoxide (DLCO) and possibly functional residual capacity, improves sensitivity. This was documented by Suliman and colleagues, who found that incorporating other measures of pulmonary function, including DLCO <70% of predicted, increased sensitivity for detecting ILD to 72%.

Although the presence and extent of baseline fibrosis on HRCT has been shown to be prognostically valuable in SSc (4), a 1992 study by Steen and colleagues also showed that among patients with SSc who had normal DLCO (defined as ≥80% of predicted, rather than ≥70% of predicted per the study by Suliman et al) at baseline, only 2 of 218 (<0.01%) developed clinically significant pulmonary disease after 7.2 years of follow-up (5). This suggests that baseline DLCO may be a sensitive indicator of pulmonary disease requiring treatment in SSc, although lacking in specificity.

Based on these considerations, we believe it may be premature to dismiss PFTs as a screening tool for clinically significant scleroderma lung disease. The significance of HRCT abnormalities suggestive of ILD in the absence of alterations in lung volumes or gas exchange remains unclear, as is reflected in the inconsistent use of this tool by rheumatologists, as described by Bernstein and colleagues.

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Reply

To the Editor:

We thank Drs. Warner and Huston for their interest in our concise communication. We agree that PFTs should be considered as a screening tool for clinically significant ILD in SSc. However, we disagree that the importance of HRCT abnormalities suggestive of ILD is unclear when alterations in lung volumes or gas exchange are absent. Patients with SSc and normal PFT parameters can still experience a clinically significant decline in their lung function over time. In a retrospective cohort study of 98 patients with SSc who had mild ILD on baseline HRCT and a mean baseline FVC of 102% of predicted, 26% experienced a clinically significant decline in lung function at 1-year follow-up (1). In the phase II trial of tocilizumab for the treatment of diffuse cutaneous SSc, the mean FVC at baseline was 82% of predicted in the control arm, yet 23% of the patients in the control arm experienced a 10% decline in FVC over 48 weeks (2). Similar findings were reported in the phase III trial by Khanna et al (3).

Moreover, there are data from population-based cohorts demonstrating that early, subclinical ILD on HRCT has both biologic and clinical relevance for predicting clinical ILD (4,5). In community-dwelling adults, subclinical ILD on HRCT is associated with lower FVC, reduced exercise capacity, elevated serum levels of interleukin-6, and an increased risk of developing clinically evident ILD and ILD-specific mortality at 12-year follow-up (4–6).

PFTs have a critical role in the initial assessment of lung function in patients with SSc, and in monitoring lung function trajectory. Yet, with its 100% sensitivity (it is the gold standard for ILD detection) and the availability of modern technology that can deliver radiation doses as low as 0.15 mGy (7), HRCT has substantial advantages. Further research into the clinical impact of HRCT screening for ILD in patients with SSc will allow for the development of clear, data-driven recommendations to inform practicing rheumatologists.

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