

Title: **Early impairment of right ventricular function in systemic sclerosis: non-invasive assessment by speckle tracking echocardiography**

PY LEROUX, C. GRANGE , J.NINET. JF CORDIER. S THIVOLET. M.OVIZE, C BERGEROT, V. COTTIN, C KHOUATRA, G.DERUMEAUX.

The aim of this study was to detect a right ventricular (RV) myocardial dysfunction by speckle tracking echocardiography (STE) in patients with Systemic Sclerosis (SSc), and its relation to stress-induced pulmonary systolic hypertension (PHT).

Twenty-two healthy subjects (48 ± 6 years) and 42 patients (51 ± 4 years, NYHA I : 15 pts and NYHA II : 7 pts), with normal resting systolic pulmonary artery pressure (PAPs: 26 ± 2 mmHg), classified as having either diffuse (26 pts) or limited form (16 pts) of SSc underwent exercise Doppler echo using a standard Bruce protocol. PAPs at rest and within 60s after exercise was calculated using the tricuspid regurgitation velocity. RV function was assessed at rest by tricuspid annular systolic excursion (TAPSE, mm), tricuspid annulus systolic velocity (St, cm/s) and systolic strain measured in the basal, mid and apical segments of the RV lateral free wall using STE. By chest-CT, 11 patients showed interstitial pulmonary fibrosis.

LV diameters and ejection fraction , RV diameters , TAPSE and St were comparable between SSc and controls. In SSc, peak systolic RV strain was reduced in the basal RV lateral free wall (28 ± 2 vs $34 \pm 4\%$, $p < 0.01$). Stress-induced PHT defined as a PAPs > 45 mmHg occurred in 13/42 patients (30%). In SSc patients with stress-induced PHT, rest PAPs was significantly higher than in controls and SSc patients without stress-induced PHT whereas TAPSE and strain were significantly lower (table).

Stress-induced pulmonary hypertension is frequent in patients with scleroderma, even when resting PAPs is normal and induces a subtle RV myocardial dysfunction. STE is a valuable non-invasive tool for detecting early RV myocardial dysfunction related to stress-induced PHT in SSc.

	Control	No stress-induced PHT	Stress-induced PHT
Rest PAPs (mmHg)	23 ± 3	24 ± 3	$29 \pm 3^*$
TAPSE (mm)	27 ± 3	26 ± 3	$22 \pm 3^*$
St (cm/s)	13 ± 1	14 ± 1	12 ± 2
Basal Strain (%)	34 ± 4	30 ± 2	$23 \pm 4^*$
Mid Strain (%)	34 ± 5	32 ± 3	$24 \pm 4^*$
Apical Strain (%)	33 ± 4	35 ± 3	$22 \pm 5^*$

* $p < 0.05$ vs control