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Myocardial work in a cohort of systemic sclerosis patients

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Context: Myocardial strain analysis provides important information on cardiac performance adding to standard parameters of left ventricular (LV) systolic function. Myocardial work (MW) is emerging as an alternative tool for studying LV systolic function, because it isn't influenced by changes in afterload that could alterate strain analysis.

Systemic sclerosis (SSc) is an autoimmune disease frequently associated with myocardial fibrosis determining diastolic and subclinical systolic dysfunction.

Aim: to assess parameters of myocardial work in patients with SSc and in age and cardiovascular risk factors matched controls.

Methods: 60 subjects (51 ± 9 years, 53 women) were studied: 40 patients with SSc (75% limited, 25% generalized form, mean time since onset 5 ± 4 yrs, mean time since treatment start 2.5 ± 0.5 yrs), and 20 age and cardiovascular risk factors matched controls. A comprehensive echocardiographic examination was performed using EACVI recommended protocols. Myocardial work parameters were calculated during mechanical systole and isovolumetric relaxation (IVR), by 2DSTE: global constructive work (GCW), performed during shortening in systole adding negative work during lengthening in IVR; global wasted work (GWW), performed during lengthening in systole adding work performed during shortening in IVR; global work efficiency (GWE), as the constructive work divided by the sum of constructive and wasted work and global work index (GWI), as the GCW added to GWW.

Results: 2DEF, 2D longitudinal strain, GWW, GWE and GWI were similar in both groups, with values expected for sex and age. GCW was significantly lower in SSc patients (Table).

Conclusion: Patients with treated SSc have lower myocardial constructive work (GCW) compared to matched controls, probably due to subtle myocardial fibrosis, persisting under adequate treatment. Longer follow up and larger cohorts are needed in order to establish the role of MW analysis in the serial assessment of patients with SSc at risk of developing overt cardiovascular disease.

Parameter	Systemic sclerosis	Controls	p
GCW (mmHg%)	2124.2 ± 449.5	3102.8 ± 337.5	0.02
GWW (mmHg%)	81.0 ± 51.3	73.5 ± 38.9	NS
GWE (mmHg%)	95.0 ± 2.8	95.9 ± 2.1	NS
GWI (mmHg%)	1869.9 ± 410.9	2023.2 ± 321.7	NS
EF (%)	61.3 ± 6.5	60.4 ± 8.7	NS
2DLS (%)	22.9 ± 3.4	22.4 ± 4.1	NS