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Association of intracellular iron status with left ventricular systolic function response to exercise in heart failure with preserved ejection fraction

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The intracellular iron depletion has been recognized to contribute to the dysregulation of cell energetics. The soluble transferrin receptor (sTfR) is regarded as a marker of cellular iron balance, and its elevated level reflects an insufficient iron delivery to target tissues. Despite the strong pathophysiological link, there is a scarcity of data on the impact of intracellular iron status on myocardial performance.

Aim: To investigate the association between the intracellular iron status, as assessed by sTfR, and left ventricular (LV) function in a well-characterized population with heart failure and preserved ejection fraction (HFpEF).

Methods: A complete echocardiogram including evaluation of LV global longitudinal deformation by speckle tracking (GLS) was performed at rest and immediately post-exercise in 83 pts (age 66 ± 8 yrs) with symptomatic HFpEF.

Results: Pts with the highest sTfR concentrations (from the 3rd sTfR tertile) demonstrated significantly lower exertional GLS than their peers from the other 2 tertiles and lower resting GLS vs. the 2nd tertile (Table). Exercise GLS was inversely correlated with sTfR ($r = -0.27$, $p = 0.01$), and this association remained significant after adjustment for age, sex, BMI, LV mass, exercise blood pressure, hemoglobin and serum galectin-3 – a marker of fibrosis ($\beta = -0.24$, $p = 0.04$).

Conclusions: In HFpEF, higher sTfR reflecting a decreased global intracellular iron content is independently associated with reduced LV longitudinal contractility response to exertion. This might represent another mechanism of exercise intolerance and should be considered in management strategies in this condition.

Abstract P935 Figure.

Variable	1 st sTfR tertile	2 nd sTfR tertile	3 rd sTfR tertile	p value 1 st vs. 2 nd	p value 1 st vs. 3 rd	p value 2 nd vs. 3 rd
GLS at rest, %	18.1 \pm 2.9	18.6 \pm 2.9	17.0 \pm 2.7	0.47	0.18	0.03
GLS at exercise, %	20.2 \pm 3.0	20.4 \pm 3.2	18.5 \pm 2.9	0.86	0.04	0.02