Analysis of the left atrial function using two dimensional strain in patients with recent diagnosis of hereditary hemochromatosis

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Background. Hereditary hemochromatosis (HH) is a genetic condition associated with a systemic iron overload caused by a reduction in the concentration of the iron regulatory hormone hepcidin or the hepcidin-ferroportin complex activity. Heart failure is the leading cause of death. It has been demonstrated early stages of systolic and diastolic left ventricular dysfunction in previous studies. The main function of the left atrium (LA) is to modulate the left ventricular filling through the reservoir, conduit and bump phases.

Purpose. To compare the LA function between asymptomatic and recently diagnosed HH patients and a control group using two-dimensional speckle tracking.

Methods. In this prospective study, 30 patients with HH (90% males, 47 ± 18 years old) and 30 healthy controls with a normal echo stress test (85% males, 45 ± 13 years old) were included. A conventional echocardiogram was performed. LA strain, LA strain rate and LA volumetric parameters during the reservoir, conduit and bump phases were studied according to the current recommendations. The LA stiffness index was calculated by using the ratio between E/e’ ratio and LA strain during the reservoir phase.

Results. LA volume was similar in both groups (36.5 ± 10 ml vs 32.3 ± 6.5 ml; p = 0.09). No differences were observed in LA ejection fraction (EF) (57.5 ± 10% vs 60 ± 5%; p = 0.32), LA passive EF (35 ± 12% vs 36 ± 9%; p = 0.82) or LA bump function (34 ± 11% vs 36 ± 9.9%; p = 0.41) between both groups. On the contrary, the HH group had lower LA reservoir strain (31.5 ± 6.5% vs 38.3 ± 7.9%; p = 0.002) and during the conduct phase (18 ± 7% vs 23.3 ± 6.4%; p = 0.01) than the control group. The LA stiffness index was significantly higher in the HH group (25.5 ± 9.1 vs 19.5 ± 6.4; p = 0.01).

Conclusion. Early abnormalities in the LA function could be detected by using two-dimensional speckle tracking study despite no evidence of changes in atrial size or volumetric parameters.

Abstract Figure.