Plasma biomarkers of endothelial dysfunction in patients with hypertrophic cardiomyopathy

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Abstract:
Impairment of endothelium-dependent coronary vasodilatation has been reported in hypertrophic cardiomyopathy (HCM). The aim of our study was to evaluate whether HCM patients have increased circulating blood markers of endothelial dysfunction. We compared 29 HCM patients with sinus rhythm, including 11 with the left ventricular outflow tract (LVOT) obstruction (gradient ≥ 30 mmHg), versus 29 age- and sex-matched controls without cardiovascular diseases. Plasma levels of the following endothelial biomarkers were determined: soluble thrombomodulin (sTM), von Willebrand factor (vWF), tissue factor pathway inhibitor (TFPI), asymmetric dimethylarginine (ADMA), symmetric dimethylarginine (SDMA) and L-arginine to ADMA (Arg/ADMA) ratio. Both sTM (49.1 ± 9.9 vs. 39.1 ± 4.8 ng/ml, p < 0.00001) and TFPI (18.6 ± 2.5 vs. 16.2 ± 1.7 ng/ml, p < 0.0001) were elevated in HCM patients compared with controls, whereas vWF levels were similar in both groups (105.8 ± 11.6 vs. 102.2 ± 10.9 U/dl, p > 0.05). Among markers related to the nitric oxide pathways, we observed elevations of both ADMA (0.57 ± 0.08 vs. 0.44 ± 0.04 μmol/l, p < 0.0001) and SDMA (0.43 ± 0.05 vs. 0.34 ± 0.04 μmol/l, p < 0.0001) and decrease in the Arg/ADMA ratio (118.1 ± 18.2 vs. 144.3 ± 22.1, p < 0.0001) in HCM patients. The obstructive HCM subgroup displayed higher values of ADMA, SDMA and sTM compared with the non-obstructive HCM subgroup.

HCM patients show specific features of endothelial dysfunction detectable in peripheral blood, involving increased sTM and TFPI, but not vWF, along with increased ADMA levels.

Key words:
hypertrophic cardiomyopathy, ADMA, endothelium