

Soluble ST2 and renal function in ischemic heart failure with atrial fibrillation

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Soluble ST2 (sST2) is a novel cardiac biomarker whose concentration rises in response to myocardial strain. The aim of this study was to analyse the relationship between soluble ST2 (sST2) level and renal function in heart failure (HF) patients with atrial fibrillation (AF).

Methods: The study involved 113 (83.2% men) patients with mean age 60.0 [54.0-67.0] years with II-IV functional class (recommendations of the New York Heart Association) is due to ischemic heart disease. Serum levels of N-terminal proBNP (NT-proBNP), sST2, TIMP-1 and Cystatine C (CysC) were quantified by ELISA of 33 patients with HF and AF and 80 patients with HF without AF. Echocardiography was performed according to the American Society of Echocardiography/European Association of Echocardiography recommendations. Estimated glomerular filtration rate (eGFR) was calculated by MDRD formula. Nonparametric Mann-Whitney U-test for independent data, Spearman's rank correlation and multiple linear regression coefficients were calculated.

Results: Patients with HF and AF characterized significantly higher concentration of sST2 (1453.2 [1184.3-1945.7] vs 1279.7 [1110.9-1616.6] pg/ml, $p = 0.05$), as well as the marker of kidney dysfunction CysC (1375 [1111.7-1867.4] vs 1136.4 [955-1386.4] ng/ml, $p = 0.02$) and was significantly lower eGFR (67.7 [60.6-77.2] vs 79.3 [70.9-88.0] ml/min/1.73m²; $p = 0.0002$). sST2 correlated with TIMP-1 ($r = 0.56$; $p = 0.004$) E/e' ($r = 0.87$; $p = 0.002$), as well as CysC with NT-proBNP ($r = 0.56$; $p = 0.002$), with age ($r = 0.49$; $p = 0.009$) in patients with HF and AF. At multivariate linear regression analysis, only TIMP-1 ($\beta = 0.63$) and left atrial volume index ($\beta = 0.22$) were independently associated with sST2 ($R^2 = 0.58$; $p = 0.002$).

Conclusions: In patients with ischemic HF and atrial fibrillation elevation sST2, associated with high level cystatine C and correlated with TIMP-1, E/e', markers which showed abnormal collagen homeostasis and significant diastolic dysfunction LV. Multivariate analysis shows, that sST2 independently associated with TIMP-1 and LAVI. Further studies are needed to clarify the prognostic role of marker renal function (CysC) and cardiovascular stress (sST2) in ischemic HF patients with atrial fibrillation.