Predicting heart failure and cardiovascular mortality after myocardial infarction: UCCS-HF risk score

D. Trifunovic Zamaklar¹, A. Veselinovic², M. Andjelkovic³, O. Petrovic¹, I. Jovanovic⁴, I. Paunovic⁵, J. Vratonjic⁴, M. Boricic Kostic⁴

¹University Clinical Centre of Serbia, Cardiology Clinic, Medical Faculty University of Belgrade, Belgrade, Serbia
²City Institute for Urgent Medical Care, Medical Faculty, Belgrade, Serbia
³Medical faculty, University of Belgrade, Belgrade, Serbia
⁴University Clinical Centre of Serbia, Cardiology clinic, Belgrade, Serbia

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In spite of the current effective management of acute myocardial infarction, post-infarction heart failure (post-MI HF) continues to be a significant medical problem, with high morbidity and mortality. The robust risk score based on readily available clinical and echocardiographic data might help to recognize patients at risk and initiate early preventive/treatment strategies for post-MI HF.

The aim of the work: identify clinical and echocardiographic independent predictors of MACE (post-MI HF hospitalization or cardiovascular death) and develop a simplified risk score to predict MACE.

Material and methods: the retrospective study, 330 post-MI patients were initially included. Clinical (age, diabetes mellitus-DM, atrial fibrillation-Af, chronic kidney diseases-CKD, cerebrovascular insult-CVI and gastro-bleeding) and standard echocardiographic parameters were analyzed.

Results: 104 patients have complete data set for analysis and represent final cohort. During the follow-up period (median: 57 months), 24% of them experienced MACE. Significant clinical MACE predictors were: chronic kidney diseases (CKD: HR 1.95, 95% CI 1.124-3.394, p = 0.017) and atrial fibrillation (Af: HR 2.66, 95% CI 1.522-4.647, p = 0.001). Significant echocardiographic MACE predictors were: left ventricular ejection fraction (EF<40%: HR 2.40, p = 0.01), right ventricular systolic pressure (RVSP≥33mmHg: HR 4.043, 95% CI 2.104-7.767, p<0.001), left atrial volume (LAVi≥46ml/m²: HR 4.377, 95%CI 1.852-10.348, p = 0.001), deceleration time of transmitral E wave (Dct≤188 ms: HR 4.00, 95%CI 1.739-9.201, p = 0.001), right ventricular diameter (Rvd≥26mm: HR 2.056, 95%CI 1.221-3.462, p = 0.007), the systolic velocity of tricuspid annuli (Sm<9.3 cm/sec: 2.068, 95%CI 0.954-4.485, p = 0.006), mitral regurgitation (MR≥2+: HR 3.657, 95% CI 2.079-6.433, p<0.001) and tricuspid regurgitation (TR≥2+: HR 2.824, 95%CI 1.669-4.778, p<0.001). A risk score for post-MI HF or CV mortality (UCCS-HF score) of 10 variables was defined with good discrimination (c-statistic 0.85) (Picture 1).

Conclusion: nearly 1/4 of post-MI patients experienced HF hospitalization or CV death within 5 years after MI. A simplified risk score (UCCS-HF score) merging clinical risk factors (CKD and Af), and echo variables (parameters of LV systolic function, LV diastolic properties, and RV systolic pressure and function) is a potentially easy, helpful, and robust tool to predict post-MI HF hospitalization and CV death. External validation and on larger patient population is needed.