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RV longitudinal dysfunction predicts outcomes in anterior ST elevation myocardial infarction treated by primary PCI

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Background: The prognostic value of LV function in the setting of an acute ST elevation myocardial infarction (STEMI) is well established, but data regarding the association between RV function and adverse events in this population of patients are still scarce, especially for the cases with anterior wall localization of necrosis. Two-dimensional speckle tracking echocardiography (STE) is able to detect subclinical changes in local or regional RV function.

AIMS: To evaluate the relation between STE parameters of RV global and regional function recorded 24 hours after admission and the occurrence of major non-fatal cardiovascular adverse events (MACE) in anterior STEMI patients treated by primary percutaneous intervention (PCI)

Methods: We have prospectively analyzed a cohort of 80 consecutive patients (mean age 61.17 years, 68.8% males) presenting with a first STEMI treated successfully by PCI. Patients with history of cardiac or pulmonary disease were excluded. All patients underwent conventional echocardiography and STE, 24 hours after the index event. RV strain was assessed as RV free wall strain (RVFWS) representing the average of peak strain values encountered in three segments of the RV free wall and RV global longitudinal strain (RVGLS) obtained by averaging peak strain values in six segments including RV free wall and interventricular septum . The mean follow-up duration was 8.2 ± 0.69 months.The combined endpoint of non fatal MACE was defined as recurrent myocardial infarction, need for repeat revascularization, hospitalization for heart failure or stroke.

Results: In the study population 45 patients (56%) had the culprit lesion on the anterior descendent artery. In this group we observed that RVGLS was predictive for non fatal MACE independent of LVEF or extension of necrosis expressed by wall motion score index with OR 0.89 95 % CI 0.7-0.9, p = 0.042, with a ROC curve with a sensitivity 73% and specificity 53%, AUC =0.7. In addition, in anterior STEMI complicated by LVEF <40 % , a RVFWS absolute value lower than -14.3 % has proved to be an additional parameter of negative prognosis with a sensitivity of 91 %, and a specificity of 40% (AUC 0.68, CI 95%: 0.3-0.7)

Conclusions: In anterior STEMI patients treated by primary PCI, global RV longitudinal dysfunction assessed by STE early after the index event is predictive for non fatal MACE independently of LV function or the infarct size. In addition, RV regional longitudinal dysfunction provides incremental prognostic information in patients with anterior STEMI with moderate or severe LV systolic dysfunction. These data highlight the importance of the assessment of subclinical RV dysfunction in this setting.