

Infarct size by contrast enhanced cardiac magnetic resonance is a stronger predictor of outcomes than left ventricular ejection fraction or end-systolic volume index: prospective cohort study

E Wu, JT Ortiz, P Tejedor, et al.
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Review

Delayed enhancement MRI is a well established technique to demonstrate myocardial infarction and its transmural extent. Many studies have demonstrated that transmural extent of the infarcted tissue early after the ischemic event can be used to predict functional recovery of the myocardial region(1, 2). However, little is known about the prognostic value of delayed enhancement MRI. This month's "*ASCI's Choice*" chose Wu et al's study in which they assessed the relative impact of infarct size, ejection fraction (EF) and end-systolic volume index (ESVI) on major adverse cardiovascular events (MACE).

In a series of 122 patients with acute ST-segment elevation myocardial infarction (STEMI), they looked at variety of different MRI parameters (infarct size, EF, end-diastolic volume index, ESVI, presence of microvascular obstruction (MO) and transmural infarct score) within 1 week after STEMI and followed them up for two years to see what MRI parameters would predict MACE. There was a statistically significant difference in basically all of the parameters between patients who did have adverse events and those who did not. They found infarct size, ESVI and EF to be independently significant, but in the multivariate analysis, the strongest predictor of adverse event was infarct size. There was a significant difference in incidence of events between patient who had infarct less than 18.5% of myocardial mass and patients who had more than 18% of myocardial mass on Kaplan-Meier curve.

Given the fact that both ESVI and EF shortly after acute STEMI can be affected by stunning or chronic hibernation, their finding is not surprising since delayed enhancement MRI can determine the true extent of myocardial damage. Suggested cut-off infarct size of 18.5% may be worth remembering because it gave a sensitivity of 88% and a negative predictive value of 96% in predicting future MACE although we should keep in our mind that there were other significant predictors of MACE such as TIMI perfusion scores, the extent of coronary artery disease, infarct transmural extent and MO, as mentioned in the limitation section.

It still remains a controversial issue which one of these interrelated MRI parameters – infarct size, infarct transmural extent and MO – has the strongest prognostic significance or should be assessed in combination with others(3). If we take the result of the “Herzinfarktverbund Essen” published earlier this year into consideration, which showed that MO is the only independent factor to predict MACE over age, gender, diabetes mellitus, infarct size, and EF, it is possible that the prognostic value of infarct size demonstrated in this study might actually come from the presence of MO(4). On the other hand, since the presence and extent of MO depend on the time interval between the ischemic event and MRI, and the time between contrast administration and image acquisition(5, 6), infarct sizing by delayed enhancement MRI may become a preferred method to assess patient prognosis with its reproducibility.

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