

Oral presentation

Myocardium at risk in ST-elevation myocardial infarction: comparison of T2 edema imaging using magnetic resonance versus angiographic scoring

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Introduction

The assessment of the area at risk (AAR) in acute myocardial infarction (AMI) with T2-weighted imaging using magnetic resonance imaging (MRI) is a relatively new method with only limited clinical data; yet, sufficient validating studies are lacking.

Purpose

Purpose of this trial was to assess the AAR and myocardial salvage by MRI and to compare it to the validated angiographic APPROACH-score in a large consecutive patient cohort.

Methods

From November 2006 to February 2008 202 patients undergoing primary angioplasty in AMI with ST-elevation were enrolled. Myocardial salvage was assessed by MRI 2-4 days after primary PCI with measurement of the extension of myocardial edema in T2-weighted images and of infarct size with delayed enhancement imaging. Angiographic scoring was done by use of the APPROACH-score.

Results

All images were assessable for measurements of the AAR, infarct size and consecutively myocardial salvage. All infarcts consistently revealed a pattern with both reversibly and irreversibly injured tissue. In contrast to the infarcted

area, reversible damage was always transmural. The AAR in the MRI-studies showed a good correlation with the angiographic AAR ($r = 0.870$; $p < 0.001$). However, as shown by Bland-Altman-analyses there was a certain bias towards an overestimation of the AAR by MRI in comparison to angiographic scoring ($35.7 \pm 10.9\%LV$ vs. $28.0 \pm 10.5\%LV$, difference 7.7 ± 5.5 $p < 0.001$). The infarct size measured by MRI was $18.0 \pm 11.6\%LV$. The calculated myocardial salvage was $17.7 \pm 11.7\%LV$. The time from symptom-onset to reperfusion had a significant impact on the myocardial salvage.

Conclusion

AAR measurement by MRI shows excellent correlation to the angiographic APPROACH-score with slight overestimation. This might be explained by the former validation of the angiographic score by pathological studies mostly in human hearts without recent myocardial infarction.