

T2-weighted bright peri-infarct edema in late reperfused myocardial infarction

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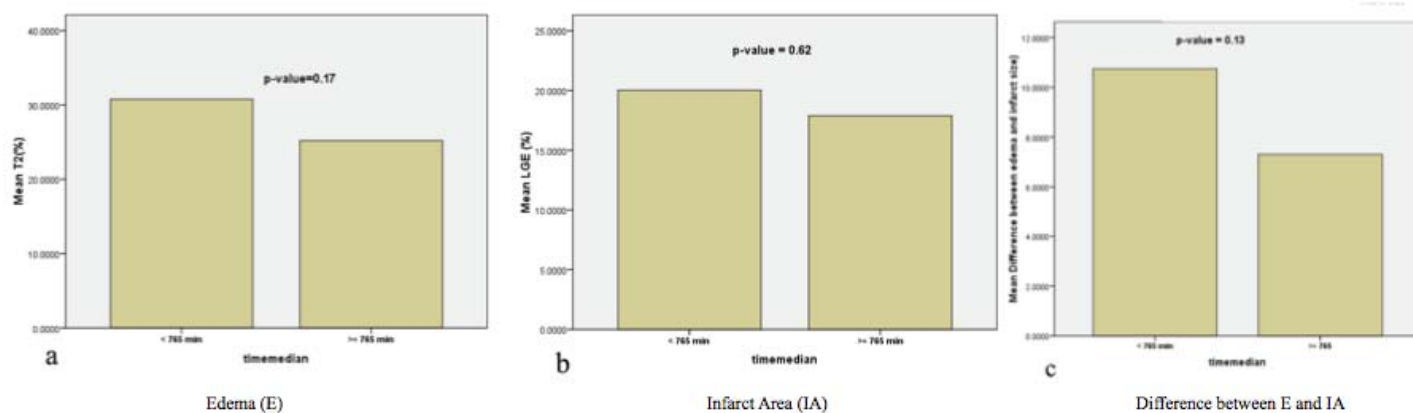
Objectives: In patients with AMI salvaged myocardium quantified by CMR is defined as the spatial difference between the area at risk (AAR) and the infarction as quantified by combined T2-weighted and late gadolinium enhancement (LGE) imaging.

After an ischemic period of more than 8 hours, relevant myocardial salvage is highly unlikely. Previous data, however, showed that more than 6 hours after the onset of ischemia the AAR was significantly larger than the infarcted area (IA). This may however be due to the fact that myocardial edema in the setting of late reperfused MI may not only present myocardial salvage, but also be caused by reperfusion injury. We hypothesize that in late reperfused infarction the T2W-bright area resulting from the difference between AAR and IA represents peri-infarct edema and not myocardial salvage.

Methods: 41 patients who underwent PCI equal or more than 8 hours after presentation with acute myocardial infarction (STEMI) to the hospital, were included in the study. Patients were subdivided into two groups based on the median time to reperfusion (group 1, n= 20) < 765 min and (group 2, n=21) ≥ 765 min. T2-weighted short tau inversion-recovery and late gadolinium enhancement (LGE) CMR images were used to characterize AAR and IA.

Results: The mean time to reperfusion was 1007 ± 813.5 minutes. In patients reperfused more than 8 hours after onset of typical symptoms, the mean difference between AAR and IA was 9.0±7.3 %. There was a strong correlation between IA and AAR (r = 0.88, p < 0.05). There was no difference between the groups with respect to AAR (30.8% vs. 25.2%, p=0.167), IA (and 20% vs. 18%, p=0.619), the difference between AAR and IA (10.7% vs. 7.3%, p = 0.132) or MVO (3.4% vs. 5.3%, p = 0.45).

Conclusion: This study demonstrates that after an ischemia time of 8 h, there is a persistent difference between AAR and IA, which does not increase over time. These data indicate that in late reperfused MI, the edema surrounding infarcted tissue likely represents reversible tissue injury not related to myocardial salvage. These findings have significant implications for the quantification of myocardial salvage by CMR in patients with late reperfused MI.



Bar graphs representing edema (a), infarct area (b) and the difference between edema and infarct area (c) showing no significant difference over time.