

MODERATED POSTER PRESENTATION

Open Access

T1 and T2 Mapping have a higher diagnostic accuracy for the ischaemic area-at-risk in NSTEMI patients compared with dark blood imaging

Jamie Layland, Samuli M Rauhalampi, David Carrick, Aleksandra Radjenovic, Christie McComb, Colin Berry*

From 17th Annual SCMR Scientific Sessions
New Orleans, LA, USA. 16-19 January 2014

Background

T1 and T2 mapping has shown great promise for the identification of acute myocardial infarction. However, most of this work has been performed in patients with ST-elevation myocardial infarction (STEMI). We prospectively studied the diagnostic accuracy of two novel (T1, T2 mapping) and one established (T2 STIR) MRI methods for imaging the ischaemic area-at-risk (AAR) in patients with a recent NSTEMI.

Methods

NSTEMI patients underwent contrast-enhanced cardiac MRI at 3.0 Tesla after percutaneous coronary intervention (PCI). The presence/extent of infarction was assessed with late gadolinium enhancement imaging (Gadovist, 0.1 mmol/kg). The infarct-related territory (IRA) was identified independently using a combination of angiographic, ECG and clinical findings. AAR was assessed with T1, T2 and T2 STIR methods by 2 observers who were blind to all of the clinical data. Comparisons were made between MRI and clinical findings.

Results

Seventy-three NSTEMI patients (mean age 57 ± 10 yrs, 78% male) underwent 3TMRI. The mean infarct size was $5.5 \pm 7.2\%$ of left ventricular (LV) volume. The AAR T1 and T2 times (ms) were 1323 ± 68 ms and 57 ± 5 ms, respectively. The extent of AAR (% of LV volume) estimated with T1 ($15.8 \pm 10.6\%$) and T2 maps ($16.0 \pm 11.8\%$) was similar ($p = 0.838$), and moderately well correlated ($r = 0.82$, $P < 0.001$). The 95% limits of agreement for mean area-at-risk estimated with T1 versus T2 maps were -13% and 13% . Mean AAR estimated with T2 STIR

($7.8 \pm 11.6\%$) was significantly lower than that estimated with T1 ($P < 0.001$) or T2 maps ($P < 0.001$). There were moderate correlations between AAR estimated with T1 maps vs. T2 STIR ($r = 0.54$, $P < 0.001$), and AAR estimated with T2 maps vs. T2 STIR ($r = 0.46$, $P < 0.001$). The 95% limits of agreement for mean myocardial AAR estimated with T1 vs. T2 STIR maps were -28% and 12% and for T2 vs. T2 STIR maps -32% and 16% . The IRA was correctly identified in 52 patients (71%) when using T1 maps, 56 (77%) for T2 maps, and 32 (44%) for T2 STIR maps. There was no difference in diagnostic accuracy with T1 and T2 maps ($P = 0.125$). A difference in diagnostic accuracy was observed between T1 maps and T2 STIR ($P < 0.001$), and T2 maps and T2 STIR ($P < 0.001$) for detecting IRA. Inter-observer agreement of infarct-related artery assignment was moderately high when analysed with T1 ($\kappa = 0.790$, $P < 0.001$) and T2 ($\kappa = 0.794$, $P < 0.001$) maps, but low with T2 STIR ($\kappa = 0.555$, $P < 0.001$).

Conclusions

T1 and T2 maps have much higher diagnostic accuracy than T2 STIR maps, implying superior clinical utility.

Funding

This study was funded through the British Heart Foundation and Health Science Scotland.

Published: 16 January 2014

doi:10.1186/1532-429X-16-S1-M4

Cite this article as: Layland et al.: T1 and T2 Mapping have a higher diagnostic accuracy for the ischaemic area-at-risk in NSTEMI patients compared with dark blood imaging. *Journal of Cardiovascular Magnetic Resonance* 2014 **16**(Suppl 1):M4.