Journal of Cardiovascular Magnetic Resonance

Meeting abstract

1033 Differences in dynamic changes in acute and chronic infarct size after bolus Gadolinium injection

Jose F Rodriguez Palomares*, Jose T Ortiz, Daniel C Lee and Edwin Wu

Address: Northwestern Memorial Hospital, Chicago, IL, USA
* Corresponding author

from 11th Annual SCMR Scientific Sessions
Los Angeles, CA, USA. 1–3 February 2008

Published: 22 October 2008

Journal of Cardiovascular Magnetic Resonance 2008, **10**(Suppl 1):A158 doi:10.1186/1532-429X-10-S1-A158

This abstract is available from: http://jcmr-online.com/content/10/S1/A158

Background

CMR is a highly accurate method of characterizing reversible and irreversible myocardial injury and obtaining information on residual myocardial viability for patient management and risk stratification. However, several studies suggested that in the acute and subacute setting, contrast hyperenhanced regions not only include infarcted myocardium, but also a portion of the area at risk (periinfarction zone), so that the overall extent of necrosis is overestimated. By contrast, studies in a canine model with 2-day-old reperfused infarcts showed that regions of hyperenhancement directly correspond to regions of infarcted tissue.

Aims

The aims of this study is to determine whether the time after Gd-DTPA injection over several minutes influences the size of contrast hyperenhancement in the setting of human reperfused acute and chronic MI, and determine the time after contrast injection that accurately predicts infarct size.

Methods

Subjects were evaluated using CMR within the first week (n = 60) and 3 months (n = 47) after a ST-segment elevation MI percutaneously revascularized. The inversion-recovery single-shot true fast imaging with steady-state precession (ss-IR) sequence was acquired 1, 3, 5, 7, 10, 15, 20, and 25 minutes after a bolus administration of 0.2 mmol/kg Gd-DTPA to analyze dynamic changes. Segmented inversion-recovery gradient-echo (seg-IR) sequences were acquired starting at 10 min after contrast and served as the gold standard for infarct size. Inversion time was properly adjusted at each time point to null normal myocardium. All images were blinded, randomized, and measured for hyper-enhancement volumes.

Results

In the acute setting, there was a significant decrease in total infarct volume over time ($p < 0.01$). These changes were more evident in the first 10 minutes while remaining more stable after that. Nevertheless, infarct size remained more constant over time in chronic MI (Figure 1). The mean infarct size in the acute and in the chronic MI by seg-IR were 24 ± 16 g and 12 ± 8 g respectively that correlated best with the ss-IR at 10 min in both cases ($r = 0.96$, $p < 0.001$ and $r = 0.98$ $p < 0.001$).

Conclusion

As previously shown in animals studies, we found that there is a change in infarct size over time in acute human reperfused MI not seen in the chronic phase. It is important to wait at least 10 minutes after contrast administration to ensure accurate determination of infarct size.

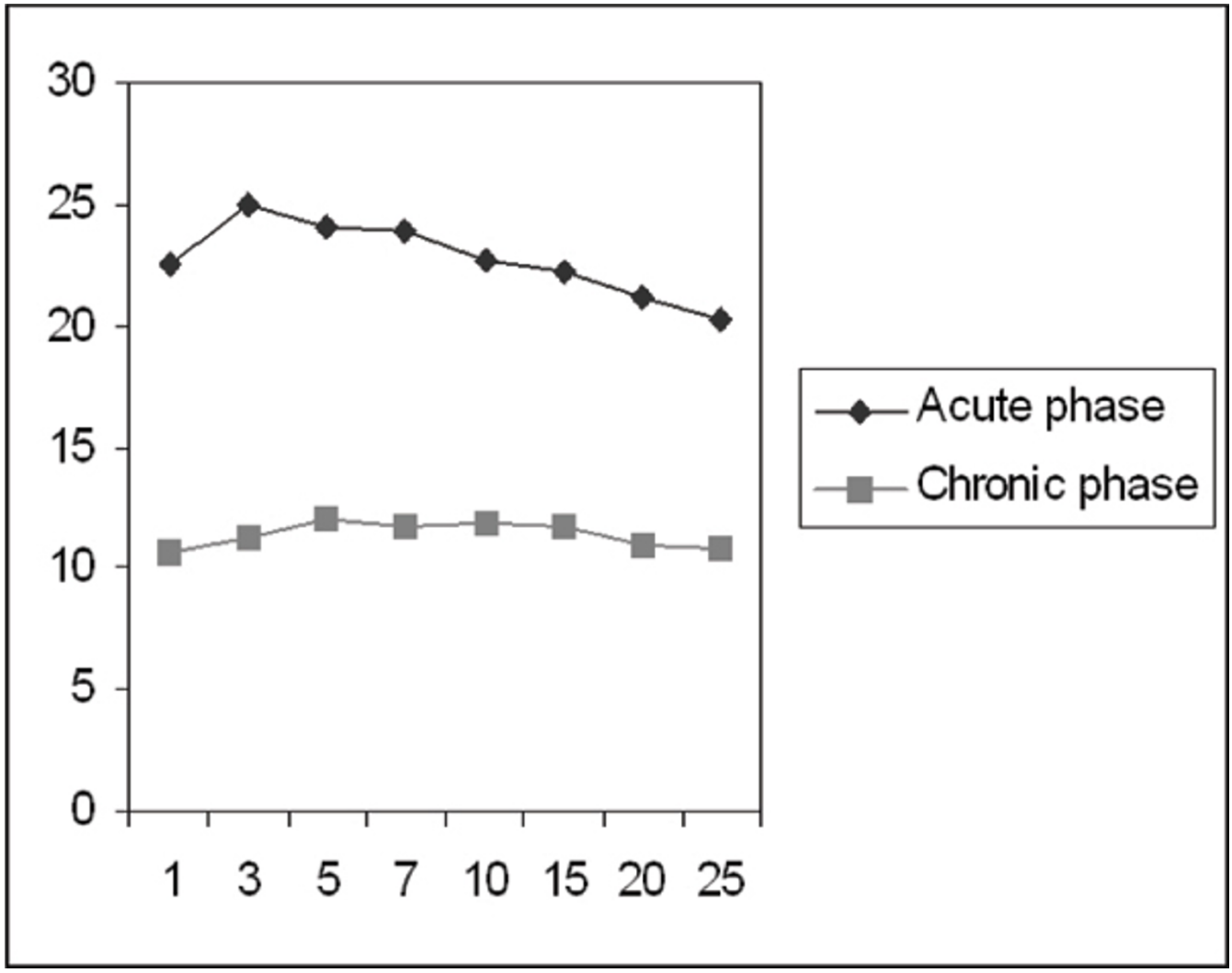

Figure 1
There is a change in infarct size over time in acute human reperfused MI not seen in the chronic phase.