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Full left ventricular coverage is essential for the accurate quantification of the area-at-risk by T1 and T2 mapping

Bulluck H., Bryant J., Lim M., Tan X., Ramlall M., Francis R., Kotecha T., Cabrera-Fuentes H., Knight D., Fontana M., Moon J., Hausenloy D.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2017 The Author(s). T2-weighted cardiovascular magnetic resonance (CMR) using a 3-slice approach has been shown to accurately quantify the edema-based area-at-risk (AAR) in ST-segment elevation myocardial infarction (STEMI). We aimed to compare the performance of a 3-slice approach to full left ventricular (LV) coverage for the AAR by T1 and T2 mapping and MI size. Forty-eight STEMI patients were prospectively recruited and underwent a CMR at 4 ± 2 days. There was no difference between the AAR full LV and AAR 3-slices by T1 ($P = 0.054$) and T2-mapping ($P = 0.092$), with good correlations but small biases and wide limits of agreements (T1-mapping: $N = 30$, $R^2 = 0.85$, bias = $1.7 \pm 9.4\%$ LV; T2-mapping: $N = 48$, $R^2 = 0.75$, bias = $1.7 \pm 12.9\%$ LV). There was also no significant difference between MI size 3-slices and MI size full LV ($P = 0.93$) with an excellent correlation between the two ($R^2 0.92$) but a small bias of 0.5% and a wide limit of agreement of $\pm 7.7\%$. Although MSI was similar between the 2 approaches, MSI 3-slices performed poorly when MSI was < 0.50 . Furthermore, using AAR 3-slices and MI size full LV resulted in 'negative' MSI in 7/48 patients. Full LV coverage T1 and T2 mapping are more accurate than a 3-slice approach for delineating the AAR, especially in those with $MSI < 0.50$ and we would advocate full LV coverage in future studies.

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