

Meeting abstract

Open Access

2017 Validation of electrocardiographic and biochemical estimates of first acute myocardial infarct size using cardiac magnetic resonance imaging

Thomas N Martin*, Galen Wagner, Allan Pettigrew, Bjoern Groenning, Robin Weir, Charles Maynard, Andrew Flapan and Henry Dargie

Address: Glasgow University, Glasgow, UK

* 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):A286 doi:10.1186/1532-429X-10-S1-A286

This abstract is available from: <http://jcmr-online.com/content/10/S1/A286>

© 2008 Martin et al; licensee BioMed Central Ltd.

Introduction

The extent of damage following acute myocardial infarction is closely related to a prognosis so it is of clinical importance to make an accurate in vivo estimate of infarct size. Routinely available data includes cardiac biomarkers and the 12 lead ECG.

Purpose

This study investigates the relationship between Troponin I (TnI), the ECG derived Selvester score (SS) and contrast enhanced Magnetic Resonance Imaging (ceMRI) measures of infarct size.

Methods

80 consecutive patients with first acute coronary syndrome underwent ceMRI at a mean (SD) of 64 (23) hours from chest pain on a Siemens Sonata 1.5 T system using a phased array chest coil. Left ventricular ejection fraction (LVEF) was evaluated using the steady state free precession breath-hold sequence. CeMRI was performed 15 minutes after peripheral injection of 0.2 mmol/kg gadolinium-DTPA using a breath-hold segmented gradient-echo inversion-recovery sequence. The scans were assessed by 2 experienced observers and the area of delayed hyperenhancement (DE) was planimeted manually. 23 patients were excluded based on ceMRI findings: 11 had DE in > 1 coronary territory; 3 had subendocardial sparing pattern of DE; and 9 were TnI positive with no evidence of DE. 57 patients (43 male) of mean (SD) age 59.8

(12.5) years were included in final analysis. Serum TnI was measured 8–12 hours following onset of chest pain. The complete 50-criteria, 31 point Selvester QRS scoring system was performed at the time of initial ceMRI by the Duke ECG core lab.

Results

Admission LVEF significantly correlates with DE ($r = -0.45$, $p < 0.001$) and SS ($r = -0.52$, $p < 0.001$) but not TnI. Infarct size by ceMRI is moderately correlated with TnI ($r = 0.69$, $p < 0.005$) and SS ($r = 0.59$, $p < 0.005$). The R^2 value for SS alone is 0.41 and rises to 0.72 when combined with TnI. The Bland Altman limits of agreement are wide for both SS (mean difference = 15 (range -11, 41)) and TnI (mean difference = -18 (range -98, 62)).

Conclusion

Both TnI and SS correlate with acute infarct size by ceMRI and this correlation improves when they are used in combination. However the limits of agreement are wide, suggesting that a similar process is being measured but that they should not be used interchangeably.