Journal of Cardiovascular Magnetic Resonance

Poster presentation

Open Access

Prognostic role of CMR in acute myocardial infarction

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from 13th Annual SCMR Scientific Sessions
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

Journal of Cardiovascular Magnetic Resonance 2010, **12**(Suppl 1):P293 doi:10.1186/1532-429X-12-S1-P293

This abstract is available from: http://jcmr-online.com/content/12/S1/P293

Introduction

Cardiac Magnetic Resonance (CMR) provides a comprehensive non-invasive characterization of acute myocardial infarction (MI).

Purpose

to test whether a single CMR study may improve the prognostic stratification of MI patients.

Methods

29 patients were studied on day 3 ± 1 after a first MI, between June 2006 and April 2007. CMR included SSFP and T2 STIR sequences, first pass perfusion, Early (EGE: 1 to 2 minutes) and Late (LGE: 10 to 15 minutes) Gadolinium Enhancement. Subsequent clinical management was not affected from CMR results, and patients underwent the usual clinical and echocardiographic follow-up. In 2009 we tested the occurrence of the end-point of cardiac death or left ventricular (LV) remodelling (EDVi > 90 ml/m^2 or LVEF < 50% at echocardiographic follow-up) in the studied population.

Results

At 23 ± 5 months follow-up, the endpoint was observed in 7 pts (25%): 1 cardiac death, 6 adverse LV remodeling. See Table 1 for the prognostic role of different CMR parameters: among the tested parameters, myocardial haemorrhage, observed in 8 pts (27%), has a unique 96,5% accuracy in predicting the endpoint, with a 100% NPV. Unexpectedly, LGE-based parameters such as total infarct mass and the presence MVO show prognostic accuracy similar to the echocardiographic LVEF <50%. The 7 pts reaching the endpoint show both MVO (globally present in 15 pts -51%-) and Myocardial Haemorrhage. It seems that the assessment of MVO should keep in account the total amount and not only the mere presence of MVO: this hampers the usefulness of MVO, since the total amount changes over time.

Conclusion

T2-STIR images allow a long-term prognostic stratification of unrivalled accuracy during the acute phase of MI. The use of gadolinium do not significantly improve the prognostic accuracy of CMR.

Table 1:

	Patients n (%)	**Positive Predictive Value %**	**Negative Predictive Value %**	**Accuracy %**
LGE (>20% LV mass)	13 (44%)	53,8	93,8	72.4
MVO (present)	15 (51%)	46.7	100	72.4
LVEF (< 50%)	14 (48%)	50.0	100	75.9
Area at risk (>40% LV mass)	9 (31%)	55.5	90	79.3
Myocardial Haemorrhage	8 (27%)	87.5	100	96.5