

POSTER PRESENTATION

Open Access

# Molecular magnetic resonance imaging (MRI) of inflamed myocardium using ferucarbotran in patients with acute myocardial infarction

Ali Yilmaz<sup>1\*</sup>, Sabine Rösch<sup>1</sup>, Karin Klingel<sup>2</sup>, Reinhard Kandolf<sup>2</sup>, Xavier Helluy<sup>3</sup>, Karl-Heinz Hiller<sup>3</sup>, Peter M Jakob<sup>3</sup>, Udo Sechtem<sup>1</sup>

From 2011 SCMR/Euro CMR Joint Scientific Sessions  
Nice, France. 3-6 February 2011

## Introduction

Superparamagnetic iron oxide nanoparticle (SPIO)-based molecular imaging agents targeting macrophages have been developed and successfully applied in animal models of myocardial infarction.

## Purpose

The purpose of this clinical trial was to investigate whether molecular magnetic resonance imaging (MRI) of macrophages using ferucarbotran (Resovist<sup>®</sup>) allows improved visualization of the myocardial (peri-)infarct zone compared to conventional gadolinium-based necrosis/fibrosis imaging in patients with acute myocardial infarction.

## Methods

The clinical study NIMINI-1 was performed as a prospective, non-randomised, non-blinded, single agent phase III clinical trial. Twenty patients who had experienced either an acute ST-elevation or non-ST-elevation myocardial infarction (STEMI/NSTEMI) were included to this study. Following coronary angiography, a first baseline cardiovascular magnetic resonance (CMR) study (pre-SPIO) was performed within seven days after onset of cardiac symptoms. A second CMR study (post-SPIO) was performed either 10min, 4h, 24h or 48h after ferucarbotran administration. The CMR studies comprised cine-CMR, T2-weighted "edema" imaging, T2\*-weighted cardiac imaging and T1-weighted late-gadolinium-enhancement (LGE) imaging.

## Results

The median extent of short-axis in-plane LGE was 28% (IQR 19-31%). Following Resovist<sup>®</sup> administration the median extent of short-axis in-plane T2\*-weighted hypoenhancement (suggestive of intramyocardial hemorrhage and/or SPIO accumulation) was 0% (IQR 0-9%; p=0.68 compared to pre-SPIO). A significant in-slice increase (>3%) in the extent of T2\*-weighted "hypoenhancement" (post-SPIO compared to pre-SPIO) was seen in 6/16 patients (38%). However, no patient demonstrated "hypoenhancement" in T2\*-weighted images following Resovist<sup>®</sup> administration that exceeded the area of LGE.

## Conclusions

T2/T2\*-weighted MRI aiming at non-invasive myocardial macrophage imaging using the approved dose of ferucarbotran does not allow improved visualization of the myocardial (peri-) infarct zone compared to conventional gadolinium-based necrosis/fibrosis imaging.

## Author details

<sup>1</sup>Robert-Bosch-Krankenhaus, Stuttgart, Germany. <sup>2</sup>Department of Molecular Pathology, Tübingen, Germany. <sup>3</sup>University of Würzburg, Würzburg, Germany.

Published: 2 February 2011

doi:10.1186/1532-429X-13-S1-P149

**Cite this article as:** Yilmaz et al.: Molecular magnetic resonance imaging (MRI) of inflamed myocardium using ferucarbotran in patients with acute myocardial infarction. *Journal of Cardiovascular Magnetic Resonance* 2011 **13**(Suppl 1):P149.

<sup>1</sup>Robert-Bosch-Krankenhaus, Stuttgart, Germany  
Full list of author information is available at the end of the article