



POSTER PRESENTATION

Open Access

Blood oxygen level dependent and adenosine-perfusion imaging correlates to invasive measurement of fractional flow reserve

Peter Bernhardt^{1*}, Robert Manzke², Thomas Walcher¹, Wolfgang Rottbauer¹

From 15th Annual SCMR Scientific Sessions
Orlando, FL, USA. 2-5 February 2012

Background

It has been shown that blood oxygen level dependent (BOLD) cardiac magnetic resonance imaging (CMR) is able to detect myocardial perfusion differences. However, validation of BOLD CMR against myocardial perfusion reserve (MPR) and fractional flow reserve (FFR) is lacking. We sought to analyze the potential diagnostic accuracy of BOLD CMR in comparison to invasively measured FFR which served as the standard reference.

Methods

BOLD and contrast-enhanced perfusion image analyses were performed at rest and during adenosine infusion in a 1.5T CMR scanner in three short axes (apical, midventricular and basal), respectively. Thirty-six perfusion territories in twelve patients were analyzed for relative BOLD signal intensity increase and for myocardial perfusion reserve. In all patients invasive FFR measurements were performed in the major three coronary arteries during adenosine infusion. A FFR ≤ 0.8 was regarded consistent with significant hypoperfusion.

Results

Relative BOLD signal intensity increase was significantly higher in myocardial segments supplied by coronary arteries with a FFR ≤ 0.8 ($p < 0.05$). The area under the receiver operator curve for BOLD and MPR analysis did not differ significantly for segments perfused by the left anterior descending artery (0.80 vs. 0.73), left circumflex artery (0.80 vs. 0.98) and right coronary artery (0.97 vs. 0.97).

Conclusions

CMR BOLD imaging reliably detects hemodynamic significant coronary artery disease and is an alternative to contrast-enhanced perfusion without use of exogenous contrast agents.

Funding

None.

Author details

¹University of Ulm, Ulm, Germany. ²Philips Clinical Sites Research Europe, Hamburg, Germany.

Published: 1 February 2012

doi:10.1186/1532-429X-14-S1-P300

Cite this article as: Bernhardt et al: Blood oxygen level dependent and adenosine-perfusion imaging correlates to invasive measurement of fractional flow reserve. *Journal of Cardiovascular Magnetic Resonance* 2012 14(Suppl 1):P300.

**Submit your next manuscript to BioMed Central
and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



¹University of Ulm, Ulm, Germany

Full list of author information is available at the end of the article