Journal of Cardiovascular Magnetic Resonance

Oral presentation

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Negative predictive value of normal adenosine-stress cardiac magnetic resonance imaging in the assessment of coronary artery disease

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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):O36 doi:10.1186/1532-429X-12-S1-O36

This abstract is available from: http://jcmr-online.com/content/12/S1/O36

Purpose

To prospectively determine the negative predictive value of normal adenosine stress cardiac magnetic resonance (CMR) in routine patients referred for evaluation of coronary artery disease (CAD), predominantly with intermediate to high pre-test risk.

Methods

Consecutive patients referred for coronary angiography were examined in a 1.5 T whole-body scanner prior to catheterization. Patients with normal CMR were included for the present analysis. Significant CAD was regarded as luminal narrowing of ≥ 70% in coronary angiography. For false-negative CMR results, exploratory semi-quantitative perfusion analysis was performed.

Results

In the 158 study patients, negative predictive value of normal adenosine-stress CMR for significant CAD was 96.2% (in the subgroup without previously known CAD: 98.3%, in patients with previous PCI: 90.7%). True negative and false negative patients were comparable regarding clinical presentation, risk factors and CMR findings. Semi-quantitative perfusion analysis gave significantly prolonged values for the arrival time index and peak time index in the false negative group.

Conclusion

The CMR exam's very high negative predictive value for CAD supports CMR-based decision making in CAD work-up to reduce the rate of superfluous diagnostic coronary angiographies. Semi-quantitative perfusion analysis may be promising to identify the small group of CAD patients not detectable by qualitative CMR assessment.