QUANTITATIVE MR IMAGING BIOMARKERS OF CORONARY REMODELING IN OLDER HYPERTENSIVE PATIENTS

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Saturday, March 24, 2012, 11:00 a.m.-Noon

Session Title: Imaging: MRI in Evaluation of Anatomy, Perfusion and Vasculature
Abstract Category: 21. Imaging: MRI
Presentation Number: 1089-170

Authors: Kai Lin, Donald Lloyd-Jones, Ying Liu, Xiaoming Bi, Debiao Li, James Carr, Northwestern University, Chicago, IL, USA

Background: The aim is to assess correlations among various quantitative imaging biomarkers of the coronary remodeling in older hypertensive patients using magnetic resonance (MR) imaging.

Methods: Two-dimensional black-blood coronary wall MR imaging and three-dimensional whole-heart coronary MR angiography were performed on 65 asymptomatic hypertensive patients. Vessel area, wall area, lumen area, wall thickness were measured. The percent of the coronary wall occupying the vessel area (PWOV) and coronary distensibility index (CDI) were calculated. Coronary indices were compared between grouped vessel segments using mean PWOV as an ad hoc cutoff point.

Results: The CDI was correlated with mean wall thickness ($r = 0.541$) and max wall thickness ($r = 0.503$) for 259 coronary segments (mean PWOV 74.5%). The PWOV was correlated with mean wall thickness ($r = 0.647$), max wall thickness ($r = 0.603$) and lumen area ($r = 0.796$). Totally 119 coronary segments (PWOV < 74.5%) had a lower mean wall thickness (1.29 ± 0.22mm vs.1.54 ± 0.23mm) and max wall thickness (1.78 ± 0.30mm vs. 2.05 ± 0.31mm), a larger mean vessel area (27.43 ± 8.39mm² vs.23.05 ± 6.35mm²), a larger mean lumen area (9.04 ± 3.34mm² vs.4.46 ± 1.68mm²) and a higher mean CDI (5.89 ± 2.65mmHg⁻¹ vs.4.79 ± 2.46mmHg⁻¹) compared with 140 segments (PWOV > 74.5%).

Conclusions: Coronary stiffness and thickening are related with coronary remodeling in older hypertensive patients. PWOV has the potential to become a quantitative imaging biomarker of coronary remodeling.