Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

IS LATE GADOLINIUM ENHANCEMENT MAGNETIC RESONANCE IMAGING NECESSARY FOR DETECTION OF TRANSMURAL SCAR TISSUE IN CHRONIC CORONARY ARTERY DISEASE PATIENTS WITH NEARLY NORMAL GLOBAL LEFT VENTRICULAR FUNCTION?

Poster Contributions
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Background: Detection and correct localization of transmural lesions can be important for optimal treatment of patients with chronic coronary artery disease (CAD). Visual wall motion score assessment (WMS) and peak systolic longitudinal strain (PLS) at rest and during dobutamine stress (DS) can detect scar tissue in heart failure patients with chronic CAD. The aim of the study was to investigate the ability of these echocardiographic measures to detect the presence and extent of scar tissue in CAD patients with normal or near normal ejection fraction (EF), in comparison to magnetic resonance imaging (MRI).

Methods: Before coronary artery bypass grafting (CABG), 57 patients underwent late gadolinium enhancement (LGE) MRI and echocardiography. Preoperatively, we evaluated the presence and degree (% of myocardial wall thickness) of LGE, and divided in groups of none, subendocardial (75%). Dysfunctional segments were identified by PLS or WMS at rest and with DS.

Results: The finding of normal/ near normal resting WMS and PLS, excellently identified segments without transmural LGE (AUC=94.0 CI= 90.6-97.3, and AUC=85.7 CI=79.0-92.3, respectively). However, the finding of hypokinesia and akinesia by resting segmental WMS and PLS did not necessarily indicate transmural scar. Negative predictive values were high (99%, CI 98-100%) while positive predictive values (PPV) were low (4%, CI 1-9% and 15%, CI 7-27%, respectively), without improvement of PPV by neither method during application of DS. In general, detection rates for subendocardial LGE were low.

Conclusion: The finding of normo- and slightly hypokinetic myocardium by resting echocardiography, using WMS or strain, detects the absence of transmural scars. However, the finding of severe hypo- and akinesia does not reliably predict transmural scarring, with no improvement by the addition of DS. Detection of predominant akinesia with less than two normo- or hypokinetic segments in the territory of a high-grade coronary stenosis or occlusion, warrants further examination by LGE MRI.