MYOCARDIAL PERFUSION RESERVE FALLS IN DIABETES AND WITH INCREASING AGE – A PERFUSION MAPPING STUDY

Kristopher Knott, Claudia Camaioni, Anish Bhuva, Gabriella Captur, Hui Xue, Charlotte Maristy, Christos Bourantas, Sven Plein, Peter Kellman, James C Moon.

Barts Heart Centre, The Cardiovascular Magnetic Resonance Imaging Unit and The Inherited Cardiovascular Diseases Unit, St Bartholomew’s Hospital, West Smithfield, London, UK; Institute of Cardiovascular Science, University College London, London, WC1E 6BT, UK; National Heart, Lung, and Blood Institute, National Institutes of Health, DHHS, Bethesda, MD, USA; University of Leeds, Leeds, LS2 9JF, UK

Objectives Myocardial perfusion reserve (MPR) is the ratio of myocardial blood flow (MBF) at stress to rest. A reduced MPR has been associated with a poor prognosis in quantitative Positron Emission Tomography studies. A likely mechanism is microvascular disease. Patients with diabetes mellitus often have microvascular disease and may have reduced MPR. We used automated in-line perfusion mapping, to quantify MBF at a pixel level in order to assess the MPR in patients with diabetes and other patients referred for clinical perfusion CMR.

Method Over 7 months, stress perfusion CMR with perfusion mapping was performed on 1201 clinically referred patients. Of these, we identified 121 who had also had angiography (invasive or CT) within 6 months (mean 6.4 weeks). Patients with unobstructed epicardial coronary arteries (<50% stenosis) were used in the final analysis (n=45). Global LV MPR was averaged across 3 short axis LV slice perfusion maps. The

Abstract 023 Figure 1  Perfusion maps (basal mid and apical LV slices) for a 50-year-old male with unobstructed coronary arteries at stress (a-c) and rest (d-f). The MPR is 4.54.

Abstract 023 Figure 2  Perfusion maps for a 63-year-old male with diabetes and hypertension. The MPR is 2.34.
MPR of patients with diabetes (n=10) was compared to those without. Patient age, sex, body surface area (BSA), LV end-diastolic volume (EDV), ejection fraction (EF) and the presence or absence of hypertension and late gadolinium enhancement (LGE) were recorded. A multivariable analysis was performed to determine the contributions of these factors to the MPR.

Results Global LV MPR was: 3.07 across all patients, 2.33 for those with diabetes and 3.27 in those without diabetes (p=0.009). Multivariable analysis indicated that diabetes and age were negatively associated with MPR even after adjustment for sex, BSA, LGE, hypertension, LV EF and EDV (p<0.05 for each group).

Conclusion In patients with non-obstructive epicardial coronary artery disease, the myocardial perfusion reserve falls with diabetes and increasing age. This is immediately visualisable by used automated in-line perfusion mapping.

SPECTRUM AND SIGNIFICANCE OF CMR FINDINGS IN CARDIAC TRANSTHYRETIN AMYLOIDOSIS

1Ana Martinez-Naharro, 1Thomas A Treibel, 1Anna Abdel-Gadir, 1Heerajnurain Bulluck, 1Giulia Zumbo, 1Daniel S Knight, 1Tushar Kotacha, 1Rohin Francis, 1David Hutt, 1Tamer Redk, 1Stefania Rosmini, 1Cristina Quarta, 1Carol J Whelan, 1Peter Kelman, 1Julian D Gillmore, 1James C Moon, 1Philip N Hawkins, 1Mariana Fontana, 1CMR Unit, Royal Free Hospital, University College London, UK; 2Barts Heart Centre, West Smithfield, London, UK; 3National Heart, Lung and Blood Institute, National Institutes of Health, Bethesda, Maryland, USA

Background Cardiac transthyretin amyloidosis (ATTR amyloidosis) is an increasingly recognised cause of heart failure. Cardiovascular magnetic resonance (CMR) with late gadolinium enhancement (LGE) and T1 mapping is emerging as a reference standard for diagnosis and characterisation of cardiac amyloid.

Abstract 024 Figure 1 Left: four-chamber SSEP cine image in diastole and corresponding late gadolinium enhancement (LGE) images of four patients; asymmetric hypertropy with sigmoid septal contour and transmural LGE (top); asymmetric hypertrophy with reverse septal contour and transmural LGE (second from top); symmetric hypertrophy pattern and transmural LGE (third from top); left ventricular hypertrophy and subendocardial LGE (bottom). Right top: Kaplan-Meier curve for ECV. Right bottom: four-chamber SSFP cine image in diastole and corresponding LGE images, native T1 maps and ECV maps of there patients, showing no LGE (top), subendocardial LGE (middle) and transmural LGE (bottom).