P3.3: CARDIAC 82RB-PET/CT REVEALS MICROVASCULAR DYSFUNCTION IN ASYMPTOMATIC PATIENTS WITH TYPE 2 DIABETES

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Abstracts

P3.3 CARDIAC 82Rb-PET/CT REVEALS MICROVASCULAR DYSFUNCTION IN ASYMPOTOMATIC PATIENTS WITH TYPE 2 DIABETES T. Hansen a,b, B. Scholten a,b, P. Hasbæk a, T. Christensen a, A. Ghobri a, A. Kjaer a,b, P. Rossing a,b aSteno Diabetes Center, Gentofte, Denmark bNuclear Medicine & PET and Cluster for Molecular Imaging, Copenhagen, Denmark

Background: We have previously described a urinary proteomic classifier (CKD273) for diagnosis of diabetic nephropathy (DN). Whether CKD273 only highlights renal damage or reflects generalised vascular damage in diabetic patients remains unclear.

Methods: We recruited 45 Type 2 diabetic patients: 15 normoalbuminuric; 15 with MA and 15 with DN: albumin:creatinine ratio 1.1 (>3.3), 7.7 (2.6-22.5), 124.5 (8.4-412.6) mg/mmol; estimated glomerular filtration rate (eGFR); 74 (46-125), 69 (49-100), 37 (6-60) ml/min/1.73m2. Participants underwent pulse wave analysis assessment of heart-rate corrected augmentation index (AIx@75) and ultrasound measurement of carotid intima-media thickness (c-IMT). Urine samples were analysed using capillary electrophoresis coupled to mass spectrometry (CE-MS).

Results: There was no difference in age (61.8±6.4 vs. 54±7; years; p=0.130), body mass index (34±6.2 vs. 35±6.1; kg/m²; p=0.995) or blood pressure (144±15/83±7 vs. 149±20/83±10; 146±16/82±12 mmHg; p=0.765/0.910) between groups. Participants were at high CV risk (Framingham score: 30±11, 38±12, 32±12; p=0.141; ASSIGN score: 36±15, 43±15, 39±17; p=0.415) and had subclinical vascular damage (AIx@75: 22 (7-38), 23 (13-21), 25 (4-35); p=0.993; c-IMT: 0.72 (0.56-1.276), 0.760 (0.614-1.082), 0.704 (0.581-0.986)mm; p=0.305) independent of eGFR (r=0.259, p=0.086 for c-IMT; r=0.302; p=0.598 for AIx@75).

Despite similar CV risk and vascular phenotypes the CKD273 classifier was significantly different between the groups (−0.169±0.373, 0.421±0.467, 0.765±0.434; p=0.002) but not related to c-IMT(r=0.075, p=0.747) or AIx@75 (r=−0.299, p=0.200).

Conclusion: CKD273 distinguished normoalbuminuria from MA and DN independent of vascular phenotype. Neither traditional renal markers nor a novel proteomic classifier appear to fully explain the vascular damage in our cohort.

P3.4 AGE-DEPENDENT DIFFERENCES IN CAROTID ARTERY CIRCUMFERENTIAL STRAIN MEASUREMENTS, INDEPENDENT OF BLOOD PRESSURE, AEROBIC FITNESS CAPACITY, GENDER AND CONVENTIONAL NON-INVASIVE PARAMETERS OF VASCULAR STIFFNESS A. Rosenberg, A. Lane, R. Kappus, T. Wee, T. Baynard, B. Fernhall University of Illinois at Chicago, Chicago, IL, USA

Background: Aging is associated with increased carotid stiffness. Functional impairment of the arterial wall may occur before structural wall changes during the atherosclerotic process and be detectable before symptoms of cardiovascular disease (CVD). Two-dimensional ultrasound imaging of vascular tissue motion and deformation (Strain) during the cardiac cycle using speckle tracking may be superior to classical markers of arterial stiffness.

Purpose: To describe the effectiveness of non-invasive methods for the evaluation of elastic properties of the arterial wall between age groups.

Method: 28 healthy volunteers aged 18-35 yrs (n=12, ≤25 yr) or 55-75 yrs (n=16, ≥63 yr) were recruited for this study. Ultrasonographic imaging of the common carotid artery was performed in the circumferential axis and strain was calculated by speckle tracking software. Conventional elasticity parameters (elastic modulus (E), and Beta-stiffness (β)) were calculated using B-mode guided M-mode sonography and non-invasive blood pressure measurements.

Results: Resting carotid pulse pressure (Young=46 +/- 8 mmHg vs. Old=51 +/- 12 mmHg) and the systolic to diastolic pressure ratio (Young=1.586 +/- 0.169 vs. Old=1.583 +/- 0.149) where not significantly different between groups. Strain and strain-rate were significantly different between age groups, even after controlling for gender, aerobic capacity (VO2peak), β, and E. Conclusion: Strain appears to be a superior measure of arterial stiffness markers when comparing age-dependent changes in vascular stiffness. VO2peak, gender, β, and E do not explain age-dependent differences in circumferential carotid arterial strain by two dimensional speckle tracking imaging.