Urinary Proteomics for Diagnosis of Nephropathy and Subclinical Vascular Damage in Type 2 Diabetes.

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

Methods.
We recruited 45 Type 2 diabetic patients: 15 normoalbuminuric; 15 with MA and 15 with DN: albumin:creatinine ratio 1.1 (0-3.3), 7.7 (2.6-22.5), 124.5 (0.8-412.6) 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, 64±6 and 59±7 years; p=0.130), body mass index (34.4±6.2, 35.1±8.1, 34.4±6.7 kg/m2; p=0.955) or blood pressure (144±15/83±7, 149±20/83±10, 148±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: 0.723 (0.563-1.276), 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=0.082 p=0.598 for Alx@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 Alx@75 (r=-0.299, p=0.200).

Conclusions.
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.