Von Willebrand factor – a potential link between microcirculation and the heart

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Aim: To assess whether high plasma values of von Willebrand factor (vWf) could predict subclinical cardiac damage in patients with arterial hypertension and type 2 diabetes mellitus.

Methods: 52 hypertensive subjects with type 2 diabetes mellitus, 51 without diabetes mellitus, and 25 controls were evaluated by plasma vWf, echocardiography, spectral Doppler and tissue Doppler imaging. Patients with coronary artery disease, heart failure or comorbidities altering endothelial function were excluded.

Results: Diabetes patients had higher plasma levels of vWf (174.5±57.3% in patients with type 2 diabetes mellitus and hypertension vs. 136.8±36.8% in patients with arterial hypertension alone and 107.3±24.3% in controls, p<0.001), lower mitral E/A ratios (0.86±0.24 vs. 1.13±0.25 and 1.14±0.24, respectively, p<0.001) and higher E/E’ ratios (9.5±2.3 vs. 7.7±1.5 and 6.2±0.6, respectively, p<0.001). Plasma levels of vWf were correlated with HbA1c levels (r=0.533, p<0.001) and parameters of left ventricular diastolic function: mean value of E’ (r = -0.457, p<0.001), mean E’/A’ ratio (r = -0.339, p<0.001), mean E/E’ ratio (r=0.409, p<0.001). Treated patients had lower plasma levels of vWf (p<0.05).

Conclusions: High plasma values of von Willebrand factor are encountered in hypertensive and diabetic patients and correlate with subclinical cardiac damage and poor diabetes control. Its levels could be decreased by antihypertensive and antidiabetic treatments, thus being a potential therapeutic target.