Abstract: P2485

Cardiac abnormalities and vascular damage in young adults with type 1 diabetes mellitus: incidence and associations with kidney dysfunction

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Background: In contrast to type 2 diabetes mellitus (DM), cardiac and vascular abnormalities in type 1 DM (T1DM) are not well investigated. We aimed to evaluate occurrence of cardiac remodeling, arterial stiffness and blood pressure (BP) phenotypes in T1DM patients.

Methods: The cross-sectional study consecutively included T1DM patients 18-44 y.o. without known CVD, in whom 24-hour monitoring of peripheral and central BP (ABPM) with BPLab Vasotens, applanation tonometry and conventional and speckle tracking echo were performed. BP phenotypes were determined according to current guidelines, PWV and CBP - according to individual reference values. Presence of systolic dysfunction was defined as global longitudinal strain (GLS) <20%, left ventricular hypertrophy (LVH) as LV myocardial mass index (LVMI) >95/>115 g/m² for women/men, LV remodeling (LVR) as RWT =0.43. P<0.05 was considered significant.

Results: A total of 125 patients with T1DM (mean age 29.2±7.6 years, 60% male, median duration of DM 6.9 [2;11] years, HbA1c 9.9 [6;12] %, mean BMI 23±3 kg/m², smoking 39%, median GFR 100 [86; 117] ml/min/1.73 m², GFR <60 ml/min/1.73 m² – in 8.8%, median albuminuria 19 [8; 24] mg/g (moderate and high albuminuria in 14.6% and 2.2%) were investigated.

According to office BP and ABPM hypertension (HTN) was diagnosed in 28% patients (true and masked in 4.8 and 23.2%, respectively) and true normotension in 72%.

Isolated nocturnal HTN was observed in 14.4%. Majority of the patients were dippers (51.2%), non-dippers and night-peakers profiles were registered in and 43.2% and 5.6%, respectively. Central SBP and PWV elevation were observed in 17.6% and 57.6% (PWV >10 m/s - only in 2.4%). Cardiac abnormalities were revealed in 72.4% of patients: GLS<20%, LVH, LVR and diastolic dysfunction (DD) in 71.2, 12, 39.2 and 16.8% patients, respectively. Isolated GLS <20% was detected in 30%, combination of GLS<20% with LVH (or LVR) and DD in 47.2%.

Patients with vs without HTN were characterized by higher PWV (7.8±1.5 vs 6.9±1.2, ?<0.001), LVMI (89.9 [75; 96] vs 71.5 [64;77] ?<0.001), incidence of DD (29.6 vs 12.2%, ?=0.03), LVH (28 vs 6%, ? =0.002), trend towards higher rate of central SBP increase (32.7% vs 17.4%, ?=0.08), lower incidence of LVR (26 vs 44%, ?=0.002) and similar GLS (?=0.16).

Groups with vs without nocturnal HTN did not differ by PWV, central SBP, GLS and LVMI. PWV increase was associated only with higher LVMI (88.2 [69; 95] vs 77.6 [68;83], ?=0.042).

Correlations (p<0.05) with albuminuria were observed for GLS (r=-0.26), DD (r=0.22) and non-dipping state (r=-0.34). GFR correlated (p<0.05) with GLS (r=-0.32) and PWV (r=-0.32).
Conclusion: Incidence of prognostically unfavourable phenotypes of HTN, cardiac remodeling and arterial stiffness (even in patients without HTN) were relatively high in T1DM population. GLS and non-dipping state correlated with albuminuria, GLS and PWV - with GFR