PAEDIATRIC NEPHROLOGY

ENDOTHELIAL DYSFUNCTIONS AND RISK OF CARDIOVASCULAR PATHOLOGY IN PATIENTS WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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Introduction and Aims: Endothelial dysfunction (ED) is recognized as one of initial mechanism of atherosclerosis and cardiovascular diseases (CVD) both in the general population and in adults with chronic kidney disease. The patients with steroid-resistant nephrotic syndrome (SRNS) have the elevated risk of endothelial dysfunction and CVD due to persistent inflammation, dyslipidemia, tendency to a progressive decline of renal function and medication side effects. The aim of study was to determine the frequency and prognostic value of ED for CVD development in children with SRNS.

Methods: Echocardiogram, blood pressure monitoring, biochemical profiles were obtained in 20 children with SRNS (mean age 11.1±4.56 years; 16 female; duration of SRNS Me=14 months; mean eGFR=99.25±22.8 ml/min/1.73m²; 8 pts received calcineurin inhibitors). Left ventricular mass established by Deverex methods and indexed to height (LVMI) was compared with age-specific percentile curves (P.R. Khoury, al., 2009). Brachial artery flow-mediated dilation (FMD) was measured using high resolution ultrasound. ED was defined as FMD < 10%. The serum levels of endothelin-1 (ET-1) and asymmetric dimethylarginine (ADMA) were determined by immunoassay method.

Results: Ten pts (q=0.5) had a ED by FMD, elevated ET-1 and ADMA were detected in 12 (q=0.6) and 2 (q=0.1) children respectively. Blood hypertension and LVH was revealed in 10 (q=0.5) and 4 (q=0.2) children respectively. There was no significant difference in age, body mass index, SRNS duration, frequency of blood hypertension, levels of proteinuria and eGFR, type of immunosuppression and hypotension therapy between children with and without ED. The group with ED characterized by male prevalence (p=0.02), higher frequencies of uncontrolled blood hypertension during more than 12 mo (p=0.02) and LVH (p=0.02). There was statistically correlation between FMD and ET-1 serum level (r=-0.48; p<0.05), common systolic blood pressure load (r=0.39; p=0.05) and duration of blood hypertension (r=-0.4; p=0.05). Increased risk of ED had male with uncontrolled blood pressure more than 12 mo and eGFR<90 ml/min/1.73m² (RR=1.2; 95% CI 1.2-2.3; p=0.05). There was no evidence of independent significance of ED for development of CVD in our pts. Increased body mass index was independently associated with risk for blood hypertension development (RR=1.44; 95% CI 1.11-1.86; p=0.05). Subjects with both increased body mass index and ED had slightly higher risk for blood hypertension (RR=1.52; 95% CI 1.17-1.98; p=0.05). Combination of uncontrolled blood pressure more than 12 mo and decreased eGFR increased the risk for LVH (RR=2; 95% CI 1.44-2.77; p<0.05). There was no additive significance of ED for LVH in our pts (RR=2; 95% CI 1.44-2.77; p<0.05).

Conclusions: ED was revealed in one half of children with SRNS. Male gender, higher duration of uncontrolled blood hypertension and LVH were characteristic for pts with ED. There was no demonstrated independent and significant additional value of ED for development of CVD in our pts.