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

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Objectives:

Endothelial dysfunction (ED) is recognized as one of initial mechanism that lead to 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 in 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 mo; mean eGFR=99,25±22,8 ml/min/1,73m^2; 8 pts received calcineurin inhibitors). Left ventricular mass established by Deverex methods and indexed to height ^{2,7} (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 were no significant difference in age, body mass index, disease duration, frequency of blood hypertension, level of proteinuria and eGFR, type of immunosuppression and hypotension therapy in children with normal and impaired endothelial function.

In contrast to group with normal endothelial function in ED'group boys (q1=0,5;q2=0,1, p=0,02), pts with uncontrolled blood hypertension more than 12 mo (q1=0,5;q2=0,1, p=0,02) and children with LVH (q1=0,4;q2=0, p<0,02) prevailed. FMD correlated with 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/1,73m^2: RR=1,75 (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 higher risk for blood hypertension, RR=1,52 (95% CI 1,17-1,98; p<0,05). Children with ED, uncontrolled blood pressure more than 12 mo and decreased eGFR were at higher risk for LVH: RR=2 (95% CI 1,44-2,77; p<0,05).

Conclusions:

The blood hypertension is the main risk factor for development of LVH in children with CKD with preserved renal function.

ED is additional risk factor for blood hypertension and LVH in children with SRNS.

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