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Chronic Kidney Disease - MBD and Hypertension
E-Poster Submissions

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info@acpn2023.org

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Comparison of kidney function markers in neonates

Nodira Murtalibova, National children's Medical Center, USA

A prematurely born infant is at risk for developing kidney disease at an older age due to the small number of mature nephrons at birth. The negative effects of hypoxia, hemodynamic instability, and the use of nephrotoxic drugs increase the risk of impaired glomerular and tubular functions of the kidneys. Measuring mean kidney volume (MKV) and measuring serum cystatin C can be early indicators of impaired renal function.

Objectives: measure size, volume on ultrasound and serum markers of the kidney function in young children born prematurely.

Methods: 37 children from 4 to 7 y.o, born prematurely checked in OPD. All children underwent measurement of blood pressure, urinalysis, serum creatinine and cystatin C levels, as well as measurements of the size and MKV by ultrasound.
Results: The average age of children was 5.8±1.2 years. Assessing blood pressure for height, 35.1% (13) of children had a blood pressure within the 90th percentile, 3/37 (8%) had pre-hypertension, 5/37 (13.5%) had the first stage of HTN, in 20 (54%) children. The average kidney volume was 34.86±8.64 ml, with a decrease in children born at 28-33 weeks of gestation (p=0.05). At the same time, the size of the kidneys in all children was within the normal range according to age. Mean level of cystatin C was 0.8 ± 0.6 mg/l, higher rates was correlated with HTN and with reduced MKV (p=0.8 and p=0.002). An increase in cystatin C above 1.0 mg/l has a strong correlation with a reduced MKV (≤32±2.84 ml, p=0.02).

Conclusion: Children born prematurely are at risk for the development of HTN. MKV is an earlier screening kidney parameter, than size. Elevated cystatin C correlated with earlier GA and with reduced MKV. These indicators can serve as early markers for determining the risk of developing kidney disease in children born prematurely.

Low birth weight as a predictor of arterial hypertension and chronic kidney disease

Altynay Balmukhanova, Al-Farabi Kazakh National University, Kazakhstan

Introduction. Arterial hypertension (HTN) presents a significant worldwide medical and social challenge, owing to its widespread prevalence and its association with increased morbidity and mortality due to cardiovascular complications. There is a hypothesis of fetal programming: low birth weight (LBW), resulting from intrauterine growth retardation or prematurity, can cause high blood pressure (BP) due to a low number of renal glomeruli at birth. Our study aimed to estimate the role of low birth weight as a risk factor for blood pressure and further kidney function.

Methods. 788 adolescents were screened for BP and examined. The average age was 16±0.2 years. Those, who had a high BP or LBW, were selected for further investigation according to the following criteria:
1. BP > 140/90 mm.Hg (3-times measurement);
2. Birth weight < 2500 g.
Then they were tested for albuminuria and serum creatinine. Used interventions: measurement of BP with digital automatic BP-monitor «OMRON» (Japan); automatic analysis for albuminuria «Cobas u411» (Germany); test for serum creatinine; estimation of GFR according to Cockrouft-Gault formula.

Results. The prevalence of high BP among adolescents is 1.2% which correlates with world data in this age group. The prevalence of LBW among participants is 5% and adolescents with high BP and LBW are 0,1%. Results of laboratory tests and estimation of GFR showed that in the group of high BP 50% have high GFR and 50% - had low GFR. Notably, 100% of them have albuminuria. In the LBW group 66,6% have low GFR and so many have albuminuria.

Conclusion. Obtained data made us conclude that low birth weight should be considered as a predictor of HTN and CKD in further life. In this relation, physicians should pay attention to the birth weight of children during a clinical examination and take BP and estimate kidney function regularly.