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Basic metabolic disorders in children with diabetic nephropathy

Ievgeniia Burlaka
National O.O. Bogomolets Medical University, Ukraine

Introduction: The increased prevalence of Type I Diabetes (T1D) has also led to an increase in the number of macro and microvascular complications of diabetes such as coronary heart disease, stroke, visual impairment, diabetic nephropathy (DN), and end-stage renal disease (ESRD). Additionally, diabetes remains the most common reason for progressing to ESRD.

Aim: To study the levels of basic metabolic disorders in children with T1D and at diabetic nephropathy.

Material and Methods: 26 children 10–16 years old with T1D and diabetic nephropathy examined. An affinity of hemoglobin to oxygen and oxidation of lipids detected using the method of spectrophotometry. The levels of cellular hypoxia marker HIF-1 measured using western blotting method.

Results: In the group of children with the firstly diagnosed T1D high level of dissociation of hemoglobin and oxygen as compared to the control group detected. In the group of children with developed diabetic nephropathy, the level of the marker was considerably lower than in the control group and patients with T1D. High level of intracellular hypoxia evaluated in all patients compared with the control. HIF-1 level considerably higher in patients with nephropathy than in children with T1D. An increase of lipids oxidation coefficient depending on the level of compensation of T1D.

Discussion: We have studied the key indicators of basic metabolic and hypoxic disorders in children with T1D and patients with diabetic nephropathy. Further study of these markers and its interdependence in the network of disorders caused by the deficiency of vitamin D3 and disorders in the system of apoptosis control especially in the aspect of diabetic nephropathy progressing is a promising direction of prophylaxis schemes creation and diabetic nephropathy treatment.