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## The Effect Of Uric Acid Metabolism Disorders On The Cardiovascular System In Children With Pyelonephritis

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### ABSTRACT

Both nephrologists [Vasilyeva M.P. et al., 2015; Mukhin N.A. et al., 2015], and cardiologists [Kuo-ChengLue.a.,2014 ] recognized the fact that most of the currently known risk factors for cardiovascular disease (hypertension, obesity, diabetes mellitus, dyslipoproteinemia, microalbuminuria, etc.) are also risk factors for chronic kidney disease (ChKD). An inverse relationship, i.e. the influence of renal pathology on the frequency of cardiovascular disease detection has been established [Galushkin A.A. et al., 2013]. This fact is especially relevant in disorders of uric acid (UA) metabolism, as the recent literature data indicate a significant role of UA in the development of cardiovascular diseases. However, these issues are intensively studied in therapeutic practice, but they are certainly relevant for pediatric practice [M.S.Ignatova, 2011; VyalkovaA.A.,2012].

### KEYWORDS

Kidneys, dyslipoproteinemia, microalbuminuria, cardiovascular disease.

### INTRODUCTION

The character of urinary syndrome was determined on the basis of general urine analysis and quantitative method - Nechiporenko test, daily protein excretion. The

functional state of the kidneys was assessed by the Zimnitsky test, serum levels of urea and creatinine, glomerular filtration rate (endogenous creatinine clearance) calculated

by the Schwartz formula. 62 children aged 10 to 16 years were examined, mean age was  $13,3 \pm 1,9$  years. There were 41 (66,1%) girls and 21 (33,9%) boys. The inclusion criteria for the study were patients with chronic pyelonephritis,

Children were divided into 2 groups. Group I consisted of 34 children with chronic pyelonephritis against uraturia (group I), 28 patients were diagnosed with primary chronic pyelonephritis (group II). All children were examined at the nephrological department of the Khorezm Regional Specialized Multiprofile

Medical Center. Blood pressure was determined by simple Korotkoff method, ECG study was done on 6-channel electrocardiograph "CARDIOFAX ECG 882-OK", heart echocardiography was done on "SIM-5000" apparatus.

The level of uric acid in plasma and daily urine was assessed on a biochemical analyzer.

### RESULTS OF THE STUDY

Heart ultrasound findings in children with chronic pyelonephritis of the compared groups.

Показатели	1 group n=34	2 group n=28	P
Single abnormal chords	17,6%	10,7%	<0,05
Multiple abnormal chords	8,8%	-	
Mitral valve prolapse	23,5%	14,2%	<0,05
Mitral regurgitation	8,8%	3,6%	
Tricuspidal regurgitation	5,8%	-	

Structural-geometric and volumetric parameters of the left heart chambers according to standard echo-cardiography in patients with chronic pyelonephritis of compared groups

Indicators	1 group n=34	2 group n=28	P
left atrium , sm	$2,6 \pm 0,05$	$2,2 \pm 0,06$	<0,05
Left ventricular end-diastolic size sm	$4,4 \pm 0,07$	$4,1 \pm 0,03$	<0,05
Left ventricular end-systolic size ,sm	$2,7 \pm 0,06$	$2,6 \pm 0,03$	

interventricular septum d, sm	0,68±0,02	0,62±0,03	<0,05
Posterior wall of the left ventricle d, sm	0,64±0,02	0,64±0,01	
interventricular septal waist volume, sm	0,3±0,01	0,31±0,01	
left ventricular posterior wall waist volume, sm	0,3±0,01	0,31±0,01	
end-diastolic volumes, ml	87,8±3,4	77,9±2,2	<0,05
end-systolic volumes, ml	27,5±1,6	24,2±0,7	<0,05
Impact volume, ml	60,3±5,1	53,7±1,5	<0,05
expulsion fraction %	68,6±0,9	68,4±0,5	

Correlations between blood uric acid levels and EchoCG parameters in patients with chronic pyelonephritis of the compared groups. (r).

Indicators	Blood Uric Acid Level	P
left ventricle	0,509	<0,05
end-diastolic volumes	0,450	<0,05
terminal systolic volumes	0,490	<0,05
interventricular septum	0,490	<0,05
Posterior wall of the left ventricle	0,548	<0,05
Left ventricular ejection fraction	0,410	<0,05

## CONCLUSION

Our studies found that increased levels of uric acid leads to ventricular hypertrophy of the heart, vegetative vascular dystonia, heart rhythm disturbances, arterial hypertension and other cardiovascular pathology in children with ChKD. The revealed changes of functional state of the heart dictate the necessity to carry out further investigations in order to continue the study of mechanisms of pathological processes development in children with ChKD as well as to perform corresponding corrective and rehabilitative actions.

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