

## IMPROVEMENT OF DIAGNOSTICS AND TREATMENT OF SECONDARY CHRONIC PYELONEPHRITIS IN CHILDREN

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### Annotation

Despite the progress made in the diagnosis and treatment of nephropathies, in most 25% of patients they continue to progress, which leads to a change in the quality of life. Purpose of the study: to evaluate the complex treatment of chronic pyelonephritis in children. Materials and methods of research. The study involved 177 children with chronic pyelonephritis on the background of dysmetabolic disorders of the oxaluria type at the age of 4 to 15 years. Results. More pronounced changes in the cytokine urine profile in patients were revealed on the background of the use of RLAT in combination with vitamin A (group II). Our study showed that the "average" concentration of IL-1, IL-6, IL-8 in urine in children of the 2nd group after treatment with 4th scheme had a more positive downward trend, compared to group 1. After treatment of group II of patients, the level of IL-10 had a relatively high tendency toward normalization ( $P_1 < 0.01$ ,  $P_2 > 0.01$ ), compared to group 1 ( $P_1 > 0.1$ ). Conclusions. 1. In the period of exacerbation of chronic (oxalate) pyelonephritis, damages to partial functions of the kidneys were noted in patients: a decrease in the glomerular filtration rate, osmolarity of urine, daily diuresis; immune disorders: a significant decrease in IL-10 and an increase in IL-1, IL-6, IL-8 in urine.

**Keywords:** chronic tubulointerstitial nephritis, IL-1, 2, 6, 8, interferon- $\gamma$  (INF- $\gamma$ ), regional lymphotropic antibacterial therapy.

### Relevance

The most important cellular elements involved in the formation of tubulointerstitial changes are proximal tubular cells (PTCs), macrophages/monocytes, and fibroblasts. A single study has demonstrated the importance of distal tubular cells.



Monocyte chemoattractant protein-1 (MCP-1) and TGF- $\beta$  are currently considered as key mediators. However, their effects are mediated by many other factors, among which the most noted are IL-1, 2, 6, 8, interferon- $\gamma$  (INF- $\gamma$ ), complement components (C), angiotensin (AT) II, platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), etc. Since the response to damage ultimately depends on the ratio of the activities of pro-inflammatory, pro-sclerotic and anti-inflammatory mediators, the influence of "protective" factors, such as anti-inflammatory IL-10, insulin-like (IGF) and vascular endothelial cell growth factor is important (VEGF).

**Objective:** to evaluate the complex treatment of chronic pyelonephritis in children.

### Materials and methods of research

The study involved 177 children with chronic pyelonephritis on the background of dysmetabolic disorders of the oxaluria type at the age of 4 to 15 years. Patients were conditionally divided into 2 groups depending on the method of treatment. Group I included 48 children who received conventional therapy (in the first three days, usually cefotaxime i/m, after the results of bacteriological study - antibacterial drug, depending on the sensitivity of the pathogen). Group II consisted of 37 patients who received antibiotics in a lymphotropic way, that is, RLAT method (regional lymphotropic antibacterial therapy) in combination with vitamin A.

Genealogical analysis of pedigree was carried out to establish the fact of hereditary burden of all examined children. The indices of the urinary cytokine profile and the functional state of the kidneys were studied in all children before and after treatment. Glomerular filtration of the kidneys was determined by the clearance of endogenous creatinine (Van Slayke) and osmolarity of urine by cryoscopic method on OMK apparatus A - 1 C - 01, oxalate by NV. Dmitrieva (1966).

Commercial sets were used to measure interleukin levels-1, 6, 8, 10 in serum and urine in children with chronic pyelonephritis: CYTELISA-IL-1b, CYTELISA-IL-1, CYTELISA-IL-6, CYTELISA-IL-8, CYTELISA - IL-10 (CYTIMMUNE, USA). Their application is based on the "sandwich" method of solid state enzyme-linked immunosorbent analysis (ELISA-enzyme-linked immunosorbent assay), the principle of which is the qualitative and quantitative determination of the antigen under study by its layer-by-layer binding to antibodies specific for it. Mathematical processing of the obtained results was carried out using computer statistical programs Excel.



## Results

More pronounced changes in the cytokine urine profile in patients were revealed on the background of the use of RLAT in combination with vitamin A (group II). Our study showed that the "average" concentration of IL-1, IL-6, IL-8 in urine in children of the 2nd group after treatment with 4th scheme had a more positive downward trend, compared to group 1. After treatment of group II of patients, the level of IL-10 had a relatively high tendency toward normalization ( $P_1 < 0.01$ ,  $P_2 > 0.01$ ), compared to group 1 ( $P_1 > 0.1$ ). After the therapy in both groups, we recorded a relatively high tendency to normalize the concentration of cytokines: IL-1, IL-6, IL-8, IL-10 in urine in children of group 2, which indicates the advantage of the 4<sup>th</sup> scheme of treatment. Analyzing the state of kidney function in the examined patients who received traditional treatment, there was an improvement in the indices, but the difference was statistically unreliable ( $P_1 > 0.1$ ). In Group II patients, after the treatment, there was a significant increase in the clearance of endogenous creatinine ( $P_1 < 0.001$ ), urine osmolality ( $P_1 < 0.001$ ), daily diuresis ( $P_1 < 0.001$ ), oxaluria ( $P_1 < 0.001$ ) compared with pre-treatment and post-treatment using conventional treatment of children of clinical group I ( $P_2 < 0.001$ ). The obtained results allowed to recommend complex treatment (RLAT + vitamin A) of chronic pyelonephritis for the prevention of frequent relapses, development of renal failure, that is, to use as a method of renoprophylaxis.

## Conclusions

1. In the period of exacerbation of chronic (oxalate) pyelonephritis, damages to partial functions of the kidneys were noted in patients: a decrease in the glomerular filtration rate, osmolality of urine, daily diuresis; immune disorders: a significant decrease in IL-10 and an increase in IL-1, IL-6, IL-8 in urine. 2. The use of complex treatment: regional lymphotropic antibacterial therapy + vitamin A in chronic pyelonephritis is an effective method of therapy, which leads to the restoration of daily diuresis, has a positive effect on the level of oxaluria, the functional state of the kidneys and cytokine urine profile: IL-10, IL -1, IL-6, IL-8.

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