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FEATURES OF COMPLEX THERAPY OF CHRONIC TUBULOINTERSTITIAL NEPHRITIS IN CHILDREN

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Abstract

Chronic tubulointerstitial nephritis (CTIN) is one of the most pressing problems in modern pediatrics. The aim of this study was to develop a method for the comprehensive correction of CTIN in children taking into account the identified pathogenetic significance of protein metabolism parameters. Material and methods. The patients were divided into 2 groups: Group 1 consisted of 41 patients who received the drug "Rutin" along with traditional therapy, group 2 consisted of 37 patients who received complex therapy: the drug "Rutin" + electrophoresis with 0.5% euphyllin, aged 4 to 15 years. Results. As a result of studying the effectiveness of complex treatment based on protein metabolism parameters, a reliable decrease in kidney damage molecules (KDM) in the urine was determined, regardless of the initial level of endogenous intoxication (EI) and the form of the disease. Discussion. Complex treatment turned out to be significantly effective for all analyzed clinical symptoms of the disease compared to other groups of patients with CTIN. Conclusion. The treatment method we offer is the most effective way to treat CTIN.

Keywords: Chronic tubulointerstitial nephritis, rutin, electrophoresis.

1. Introduction

The solution to the problem of increasing the efficiency of diagnostics and treatment, prevention of chronic tubulointerstitial nephritis in children would be incomplete without studying the state of the cell membranes of the renal tissue of a growing child's body, with subsequent correction of the identified shifts in the functional state of the kidneys [6, 7].

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Currently, antioxidants, nephroprotectors, and physiotherapeutic procedures are used to treat patients with CTIN along with antibacterial, immunomodulatory, anti-inflammatory and detoxifying therapy [1, 2].

In recent years, the possibility of using the drug "Rutin" in the treatment of CTIN has attracted increased attention from researchers, given the numerous positive properties of this relatively new drug in correcting the metabolic and functional systems of the kidneys, while not having side effects [3, 10]. The available individual studies devoted to the use of the drug "Rutin" in the complex treatment of CTIN in children and indicating the prospects of its use, are fully do not reveal all aspects of such a complex aspect of the problem [4, 5]. Electrophoresis with 0.5% euphyllin has a positive effect on the distribution of fluid in the interstitial tissue, which ensures a non-specific rapid response of the body of patients with sanogenetic CTIN, and also contributes to the normalization of some pathogenetic links of metabolic disorders [8, 9].

Our choice of complex treatment – electrophoresis with 0.5% euphyllin – is explained by its high efficiency in spasmolytic effect on smooth muscles of urinary tract, hypotonic and diuretic effect on glomeruli of nephron of renal tissue.

Thus, we have developed a method of complex application of the drug "Rutin" + electrophoresis with 0.5% euphyllin. The named method of pathogenetic treatment of patients with CTIN is not described in literary sources.

The purpose of this work was to develop a method of complex correction of chronic tubulointerstitial nephritis in children taking into account the identified pathogenetic significance of protein metabolism parameters.

Material and methods of the study

According to the treatment regimen, the patients were divided into 2 groups: Group 1 consisted of 41 patients who received the drug "Rutin" along with traditional therapy, Group 2 consisted of 37 patients who received complex therapy: the drug "Rutin" + electrophoresis with 0.5% euphyllin, aged 4 to 15 years.

General clinical examination included a detailed analysis of the anamnesis, assessment of living conditions, determination of the level of urea, creatinine, MPP, total protein and protein fractions, a complete laboratory examination based

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on the data of a complete blood count, urine ("urinary syndrome"), Nechiporenko test, feces. Methods for studying protein metabolism indicators included determining the activity of protein fractions (total albumin concentration (TAC), effective albumin concentration (EAC), albumin binding capacity (ABC), toxicity index (TI), altered albumin concentration (AAC) in blood plasma according to Gryzunov Yu.A., Dobretsov G.E. (2013)) and KDM in urine and blood plasma according to Kalkar (2002).

In determining the diagnosis of CTIN, we used the classification proposed by N.A. Korovina (2003). The patients underwent general clinical, laboratory and instrumental examinations.

Study Results

The children were divided into 2 groups depending on the method of therapy. The first group (control) consisted of 41 (34.1%) patients with CTIN, aged 4 to 15 years (22 (53.7%) girls, 19 (46.3%) boys), who received the drug "Rutin" along with traditional therapy. During the clinical examination of patients upon admission, all children (100%) were assessed as having a moderate condition.

The second group (main) consisted of 37 patients who received complex therapy: the drug "Rutin" + electrophoresis with 0.5% euphyllin. Electrophoresis was performed with 0.5% euphyllin solution in warm water on the lumbar region, during urine sanitation (on the 3-4th day of treatment), contraindication: high activity of the pathological process and urodynamic disorders.

As a result of studying the effectiveness of complex treatment for protein metabolism indices: KDM in urine, EAC, ABC, TI, AAC in blood plasma in patients of group 2, we determined a reliable decrease in KDM in urine to 0.207±0.012 units of optical density (p1=0.001), regardless of the initial level of EI and the form of the disease. Whereas, in patients of group 1, the level of KDM in urine during therapy was 0.605±0.023 units of optical density (p1=0.05).

The restoration of the studied parameter in children of the 2nd group occurred on the 8-9th day, and in most patients of the 1st group it remained unchanged even on the 11-12th day of treatment.

In addition, this modified treatment method contributed to a reliable increase in the level of EAC, ABC and a decrease in TI, AAC in the blood plasma of children of the 2nd group.

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We determined that the complex treatment has a positive effect on the level of EAC, which in children of the 2nd group was 37.5 ± 0.3 g / l (p1 = 0.001, p2 = 0.05), while in patients of the 2nd group, this indicator was 33.04 ± 0.5 g / l (p1 = 0.05) (Fig. 1).

The dynamics of the AAC indicator in patients who received complex modified treatment was positive in relation to that in children of the 1st group. In children of group 1, against the background of treatment, the level of AAC had an insignificant tendency to decrease compared to the indicators upon admission 6.66±0.10 g/l (p=0.05) and amounted to 6.28±0.15 g/l (p1>0.1), while in children of group 2 this parameter amounted to 4.6±0.11 g/l (p1=0.05; p2=0.05), i.e., it significantly decreased and, thus, approached the level in healthy children.

The use of complex therapy contributed to a reliable increase in the ABC level in children of group 2, which amounted to 87.9±0.3% (p1=0.001; p2=0.001), while in children of group 1 this indicator was 79.4±1.2% (p1=0.001), respectively (Table 1). We observed a similar picture in relation to TI, its decrease in group 2 was 44% and was reliable 0.16±0.004 conventional units (p1=0.001; p2=0.05) compared to group 1, where this indicator was 0.25±0.005 conventional units. (p1=0.05) (Fig. 1).

Thus, the complex treatment was combined with a statistically significant decrease in KDM in urine, as well as an increase in EAC, ABC and a decrease in TI, AAC in blood plasma. This effect is associated with the positive effect of complex treatment on the stability of renal cytomembranes.

Table 1 Dynamics of protein metabolism parameters in CTIN after therapy (M±m)

Parameters	In healthy (n=25)	Before therapy (n=120)	After therapy	
			I group (n=41)	II group (n=37)
in blood plasma				
KDM, unit of optical density	0,136±0,021	0,148±0,04 p>0,1	0,108±0,002 p_1>0,1	0,101±0,0029 p_1>0,1; p_2>0,1
in urine				
KDM, unit of optical density	0,136±0,021	2,23±0,08 p=0,001	0,605±0,023 p_1=0,05	0,207±0,012 p_1=0,001; p_2=0,05

Note: p is the reliability of the difference between the parameters in healthy children and in children with CTIN. p1 is the reliability of the difference between the parameters before and after therapy. p2 is the reliability of the difference between the group of children who received the drug "Rutin" and the group of children who received complex therapy.

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Thus, the analysis of the dynamics of KDM in urine, EAC, ABC, TI, AAC in the blood plasma of sick children of group 2 indicates a pronounced "antitoxic" effect of complex treatment, which allows it to be used to correct impaired protein metabolism parameters in children with CTIN. The results of the studies indicate that complex treatment of patients in group 2 leads to a more stable correction of shifts in partial renal function already in the dynamics of treatment. Discussion of the study. To compare the methods of treatment, sick children were divided into 2 groups depending on the method of therapy.

Thus, complex treatment turned out to be significantly effective for all analyzed clinical symptoms of the disease compared to other groups of patients with CTIN. The restoration of the studied parameters in children of the 2nd group occurred on the 8-9th day, and in most patients of the 1st group even on the 11-12th day of treatment they remained unchanged.

In addition, this modified method of treatment contributed to a reliable increase in the level of EAC, ABC and a decrease in TI, AAC in the blood plasma of children of the 2nd group.

Thus, the complex treatment was combined with a statistically significant decrease in KDM in urine, as well as an increase in EAC, ABC and a decrease in TI, AAC in the blood plasma. This effect is associated with the positive effect of the complex treatment on the stability of renal cytomembranes.

Thus, the analysis of the dynamics of KDM in urine, EAC, ABC, TI, AAC in the blood plasma of sick children of the 2nd group indicates a pronounced "antitoxic" effect of the complex treatment, which allows it to be used to correct impaired protein metabolism indicators in CTIN in children. In addition, the modified treatment method we propose promotes more stable correction of not only the aseptic inflammatory process, but also metabolic and partial disorders. Thus, the complex of therapeutic measures has a beneficial effect on aseptically inflamed and irritated renal tissue.

We noted that the physical factors that we used in the latent process were of great importance in the treatment of CTIN. The positive effect of electrophoresis was due to the improvement of renal hemodynamics, tissue oxygenation, cellular metabolism, reducing the increased tone of the smooth muscles of the upper urinary tract and activating the secretory function of the kidneys, electrophoresis promotes the excretion of sand and small stones from the renal tissue into the

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urine. Under the influence of heat, electrical stimulation and 0.5% euphyllin, blood circulation, metabolic and reparative processes are activated, kidney function improves. All this helps prevent the development of disability and reduce the number of child mortality from CRF.

Conclusion

1. Patients with CTIN show changes in protein metabolism parameters (a decrease in TCA, EAC, ABC and a stable increase in the content of TI, AAC in the blood plasma, as well as an increase in KDM in the urine) at an earlier stage, before the characteristic laboratory changes in the blood and urine, which determines the importance of this diagnosticum for identifying aseptic inflammation in the renal tissue. Thus, the higher the level of KDM in the urine, the more active the aseptic inflammatory process in the renal tissue, indicating a predominant tubular type of renal dysfunction.
2. Analysis of the study results showed that the treatment method we propose is the most effective way to treat CTIN, due to accelerated recovery of both clinical and laboratory parameters of the disease and EI indicators, which leads to a reduction in the length of hospital stay, a decrease in the number of relapses of exacerbations, and prevention of complications of the chronic process.

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