

The Significance of Correlation Analysis in the Diagnosis of Functional Constipation in Children

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ABSTRACT

The article discusses modern views on the problem of functional constipation, discusses the correlation relationship of immuno-biochemical parameters in functional constipation in children. The current causes leading to the development of constipation in children are considered, pathogenetic and diagnostic principles of functional constipation in the practice of a pediatrician are described.

The relevance of the problem: Every second or third able-bodied adult and every fourth child suffers from constipation [1-5]. In more than a third of children with this problem, the disease takes a chronic course. In 35% of girls and 55% of boys suffering from constipation, encopresis is observed, and in 4% of children with chronic constipation, fecal anointing is noted [4]. It is difficult to establish the true prevalence of constipation in children due to parents' underestimation of the seriousness of the problem and, therefore, low access to a doctor, as well as due to the lack of uniform criteria for diagnosis. The presence of many age-related and individual children's features of the structure and development of the colon causes a significant variability in the frequency of stool in a child.

It is known that prolonged constipation without treatment can negatively affect the state of the intestine and the body as a whole. The retention of fecal masses, as well as straining during attempts to defecate, contribute to the development of hemorrhoids, colitis, paraproctitis, rectal prolapse, coprostasis, encopresis, secondary megacolon, general intoxication of the body. Megacolon is one of the causes of chronic constipation in children. The main contingent of patients with megacolon is children, so this aspect of the problem is not only medical, but also social.

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The purpose of the study: To study the immuno-biochemical parameters of blood in functional constipation in children.

Materials and methods: the immuno-biochemical parameters of blood were studied in 60 sick

children with constipation. During the study and examination of the patients of the examination group, a significantly higher frequency of family burden of constipation was established. FZ in children with a hereditary predisposition to constipation occur against the background of perinatal central nervous system (CNS) damage, vegetodistonia and neuroses of various etiologies.

Anemia of various etiologies is noted in the clinical picture of the Federal Law. Young children against the background of perinatal damage to the central nervous system and untimely immunization according to the calendar of the Republic of Uzbekistan, suffer from frequent acute respiratory infections. And also the long-term use of sedatives prescribed by a neurologist for the perinatal damage to the central nervous system contributes to the early formation of constipation. After suffering a violation of cerebral circulation in preschool children, an independent suppression of the act of defecation was revealed, which parents associate with a change in living conditions. Early artificial feeding in the anamnesis and quantitative under-feeding, insufficient intake of water and liquid were characteristic for children with FC.

In addition to constipation, the children suffered from food allergies. Often, overweight was also found in children with constipation. They had constipation against the background of lymphatic-hypoplastic diathesis and hypodynamia. To study the clinical features of the course of constipation in children in relation to the biochemical parameters of blood, general laboratory and biochemical blood tests of the examined contingent were conducted. The results obtained differ in comparison of blood control parameters (table 1).

Anemia was found in children with FC in both examined groups. In group 1 of patients, blood counts differ in relative lymphocytosis-43.3±10.4% and uremia-7.01±2.36 mmol/l versus control - 34.8± 4.1% and 5.5± 1.1mmol/l, respectively. The obtained indicators in the comparison groups have no statistical significance, but show a biochemical shift in the blood, which is characterized by a variety of clinical manifestations of the underlying disease.

Table 1. General laboratory and biochemical parameters of blood in functional constipation in children

Indicator	Healthy children,n=30	1-gr n=30	2-gr n=30
Hb g/l	126,3±7,9	106,3±10,0	107,3 ±9,0
Erythrocytes x106/l	4,0±0,6	2,97±0,3	3,54±0,7
Leukocytes x109/l	5,7±1,3	5,7±1,5	7,5±2,0
Platelets (abs)	262700±55948	204333±36720	200133±32930
Lymphocytes (%)	34,8± 4,1	43,3±10,4	25,8±6,37
Total protein g/l	69,2 ±5,7	65,4±4,2	66,3±4,7
ALT mmol/L	0,4±0,19	0,47±0,18	0,42±0,12
AST mmol/l	0,33± 0,14	0,44±0,19	0,4±0,15
Bilirubin mmol/l	8,36 ± 2,37	8,05±1,8	9,78±4,0
Urea mmol/l	5,5±1,1	7,01±2,36	7,3±1,8
Creatinine mmol/l Sugar mmol/l	65,5± 8,9	65,3±7,38	69,1±10,8
Creatinine mmol/l Sugar mmol/l	4,0± 0,7	4.25±0,83	4,42±0,8

Anemia-107.3 ±9.0 g/l, an increase in the absolute number of white blood cells to 7.5±2.0 x109/l, a decrease in the relative number of lymphocytes to -25.8±6.37% versus control - 126.3±7.9 g/l, 5.7±1.3 x109/l, 34.8± 4.1 was characteristic for patients of the 2nd group of examination%, respectively. Attention is drawn to the increase in the level of bilirubin-

9.78±4.0mmol/l, urea- 7.3±1.8 mmol/l and creatinine- 69.1±10.8 mmol/l in group 2 patients compared to the control - 8.36 ± 2.37 mmol/l, 5.5±1.1mmol/l, 65.5± 8.9 mmol/l, accordingly. The obtained characteristic changes in the studied blood parameters indicate a comorbid course and lability of metabolic processes in children with FC.

To develop specific criteria for the severity of the course and development of anatomical secondary changes, as complications of FC in children, it is important to study the relationship of immunological and biochemical blood parameters.

Correlation analysis always allows determining the outcome of the pathological process. In our studies, as a result of correlation analysis between the studied blood parameters in children with FC, depending on the development of secondary anatomical changes in the intestines, a high positive relationship of blood leukocytes and IL-6 -r =0.42, with IL-8- r=0.52, with a high negative relationship with TNF-α- r = -0.42 was established. The obtained result indicates an inflammatory process in the intestines with FC in children of the 1st group of examination (fig. 1).

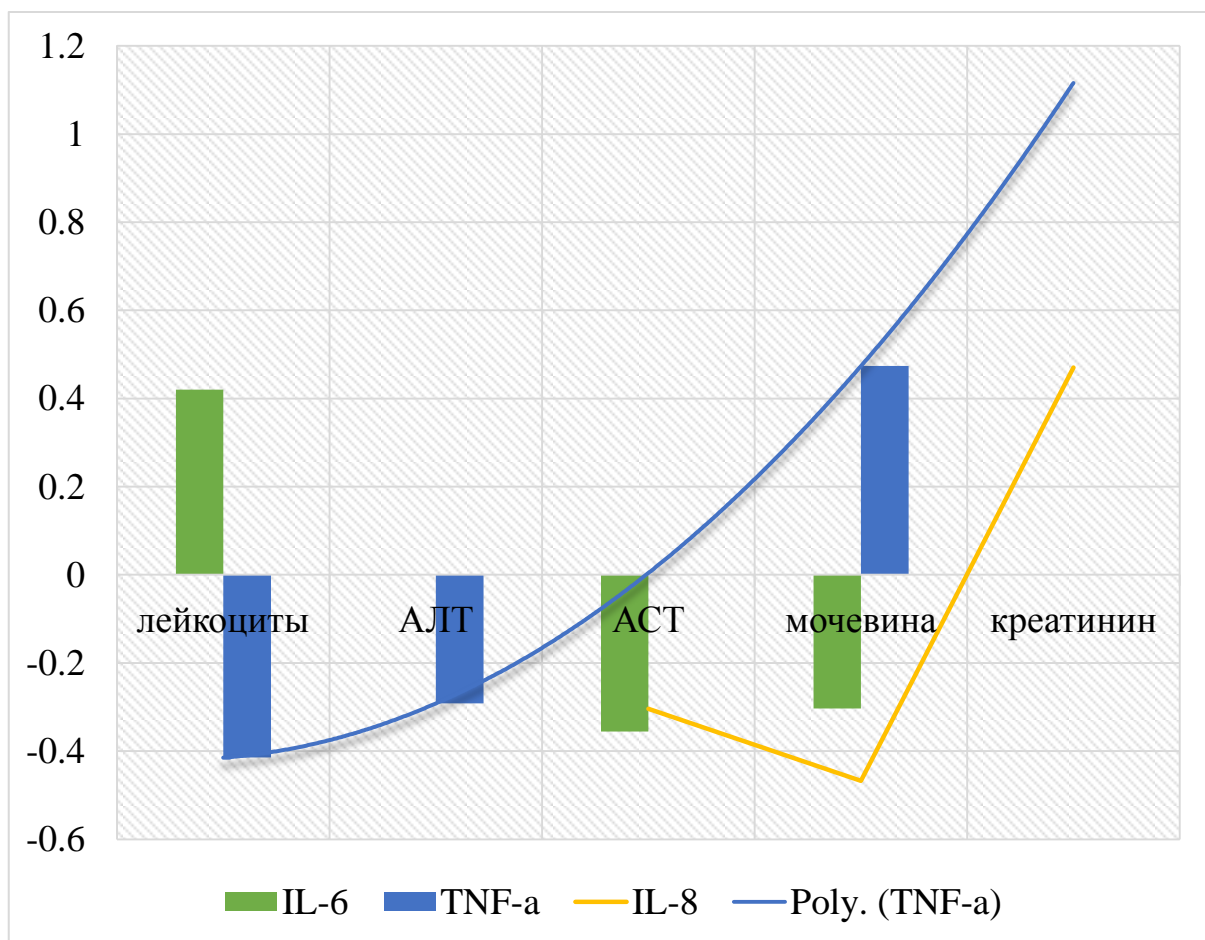


Figure 1. Correlation of immuno-biochemical parameters in functional constipation in children

Such a high positive relationship was found between total blood protein and IL-6- r=0.49, and the relationship of total blood protein with IL-8- r =0.34. The liver, as the central organ of homeostasis, was also involved in the pathological process. At the same time, an average negative association of ALT with TNF-α- r= -0.31, AST with IL-6 -r= -0.35 and with IL-8- r= -0.31 was established.

To study the effect of constipation on glomerular filtration, the relationship of the studied

cytokines with urea and cretinin - blood was also studied. At the same time, in group 1 patients, high positive associations were established between blood urea and TNF- α - $r=0.47$, between blood creatinine and IL-8- $r= 0.47$. It should be noted that there is an equally high but negative relationship between blood urea and IL-8- $r= -0.47$.

Thus, children with FZ at the stage of compensation and subcompensation have an increased risk of developing a reactive inflammatory process not only in the intestine, but also in vital organs such as the liver and kidneys with the development of reactive hepatitis and nephritis with FZ. The study of the value of proinflammatory cytokines in the development of anatomical secondary changes in the intestine (in sick children of the 2nd group of examination) allowed us to establish an average negative relationship between TNF- α - and blood leukocytes $-r= -0.30$, as well as between TNF- α - and blood creatinine $r= -0.40$, with a high feedback between AST and TNF- α - $r= -0.52$ (fig. 2).

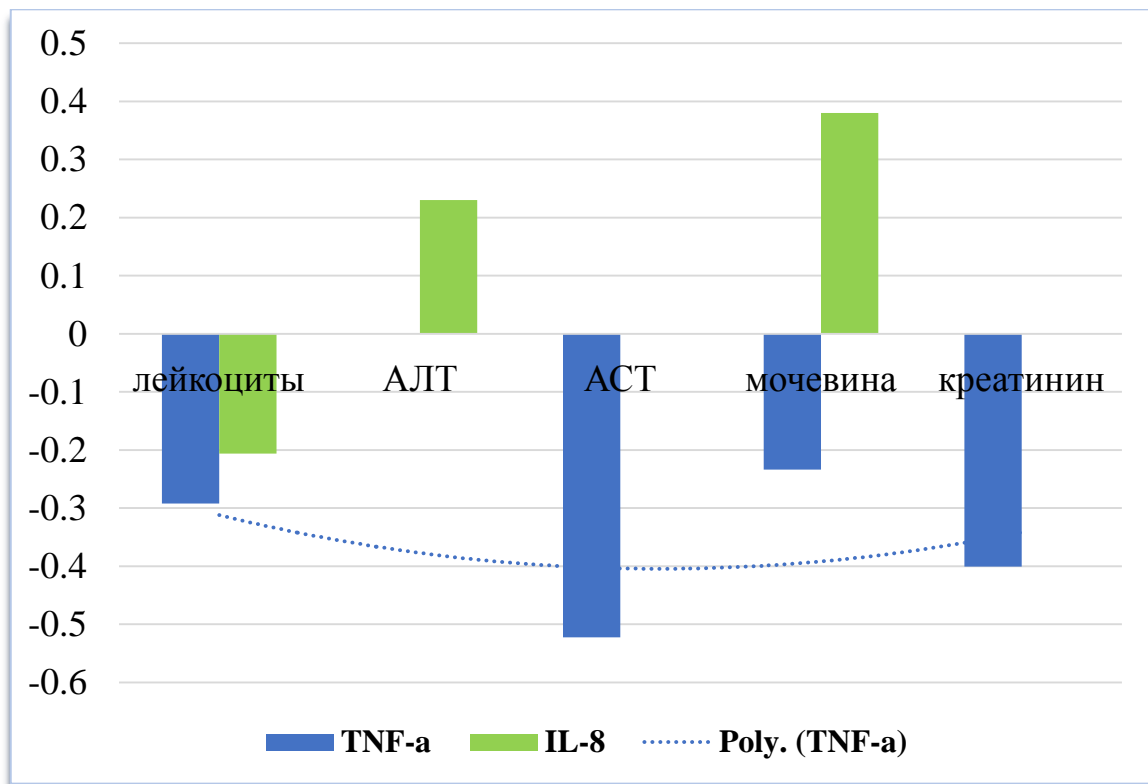


Figure 2. Correlation of blood biochemical parameters with cytokines in anatomical complications of functional constipation in children

Only a positive average relationship between blood urea and IL-8- $r=0.38$ was revealed. The results obtained indicate the activation of cell apoptosis and the development of the infectious process as a result of dysbiosis.

At the same time, AST is a marker of the breakdown of tissue structures, and blood urea is an indicator of the severity of the course of FC in children. Thus, the correlation analysis of the relationship of blood parameters in children with FC revealed the risk of secondary anatomical changes in the structure of the intestine.

Using correlation, markers and indicators of the outcome of the Federal Law were determined. The established negative associations of the studied cytokines with blood leukocytes indicate the chronization of the process and the state of areactivity. The study found that blood AST acts as a marker of tissue destruction in functional constipation, and blood urea at the same time shows the risk of dysbiosis and the development of secondary infections.

Thus, the results of the correlation analysis of immuno-biochemical blood parameters in functional constipation in children allowed us to determine prognostic markers of inflammation and tissue destruction in chronic constipation: an increase in the level of AST in the blood of patients in this category indicates the beginning of the disintegration of intestinal tissue with the risk of megacolon or dolichosigma (or other secondary anatomical changes in the structure of the large intestine), which is very important when choosing a method of their treatment (especially the high risk of postoperative complications during surgical correction of the intestine).

It is important to take into account the availability and prostate of the method for determining AST and urea in the blood, because their correlations allow limitations in conducting only biochemical analyses. All this allows saving financial costs for tests, reducing postoperative complications, disability of children and preserving the quality of life of patients in this category.

Conclusions. In children with functional constipation, high positive associations were established between blood urea and TNF- α - $r=0.47$, between blood creatinine and IL-8- $r= 0.47$, a negative relationship between blood urea and IL-8- $r= -0.47$; -in complications of functional constipation in children, a high inverse relationship between TNF was revealed- α - and blood creatinine $r= -0.40$ and between AST and TNF- α - $r= -0.52$.

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