



CLINICAL AND IMMUNOLOGICAL FEATURES OF ACUTE DIARRHEA IN CHILDREN WITH HEMOCOLITIS SYNDROME

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ABSTRACT

The purpose of this work is clinical and immunological analysis of hemocolites. Hemocolitis can be a symptom of many serious diseases of the digestive tract. There is an increase in the incidence of acute diarrhea in children in the republic, therefore, the need to study the clinical and immunological features of acute diarrhea in the clinical course of gastrointestinal disorders, hemocolytic syndrome, secondary complications and develop recommendations for the treatment and prevention of clinical conditions: acute intestinal infections occurring with the presence of streaks or blood clots in the stool is important. The article presents data on clinical and immunological features of analyses of children of different ages.

We know that hemocolitis in children is a manifestation of hyperergic inflammation of the colon wall, which is accompanied by the appearance of blood in the feces. Hemocolitis is a syndrome that reflects the localization and type of pathological process in the intestine. It is not an independent nosological unit in the medical classification, since the diagnosis is established by the underlying disease that caused the defeat of the colon. Hemocolitis accounts for about 8% of all cases of diarrheal syndrome in children, is a predictor of the severe course of the

disease and requires urgent initiation of therapy, therefore it is an urgent problem of modern pediatrics [33,34]. This form of inflammatory processes manifests itself against the background of intestinal infections, invasive diarrhea, non-infectious inflammatory diseases, as well as severe forms of hyperergic inflammatory processes, that is, allergic colitis is most often associated with intolerance to cow's milk proteins; provoked by the consumption of nuts, chocolate, fish and seafood.



[21,22,2124, 25]. Such a reaction is observed against the background of dystonia of autonomic nervous reactivity, with a predominance of the tone of the sympathetic or parasympathetic nervous systems [3,6,8,12,14,20,29]. In addition to bloody impurities in the stool, patients are concerned about abdominal pain, which respectively increase the reactivity of the sympathetic nervous system [20,29,30,32], diarrhea, and other dyspeptic disorders, intoxication syndrome. With an increase in the activity of the pro-oxidant system, a decrease in the antioxidant system, causing dystrophic changes at the cellular level [6]; accordingly, against the background of such a reaction, the mitotic, productive states of the body's cells sharply decrease [7,9,11,13,19,27,31,]. In addition, the release of inflammatory exudate into the intestinal space, with admixtures of blood, that is, the inclusion of mucus, a large number of red blood cells, leukocytes and intestinal epithelial cells.[15,1, 2,16,35], contributes to a decrease in the total volume of blood and intercellular fluid, respectively, and activation of the hypothalamic-pituitary system, with the release of vasopressin and aldosterone into the blood [4,10,26,28,Nurimov] in the complex of the predominance of catabolic processes in this process, against the background of the predominance of ergotropic function of the autonomic nervous system [29], enhances the inflammatory process. An increase in catabolic processes in the body helps to reduce the body's resistance, the latter of which provides conditions for the development of hyperergic inflammation, allergic inflammation.

In modern conditions, cytokines as informative markers and mediators of the

inflammatory process and immunity may have clinical and prognostic significance[5,16,20]. In infectious invasive diarrhea in children, this problem is still insufficiently studied. Based on the above data, clinical and immunological analysis of hemocolites remains an urgent problem in pediatrics.

The purpose of the study. The purpose of this work is clinical and immunological analysis of hemocolites.

The object of the study is methods. Studies were conducted in children under 3 years of age, male and female, with acute infectious gastroenteritis, enterocolitis, hemocolitis.

Research methods. The methodology of scientific cognition with consistent evidence is used in the work, analytical (analysis of the literature on the issue under study), empirical (analysis, comparison and observation) and applied methods of scientific cognition were applied; clinical and laboratory studies, general blood analysis, enzyme immunoassays (EIA, PCR), as well as general stool analysis.

The results of the survey and their discussion. When evaluating the data in all groups, the ratio of girls and boys was 1:1.5. Analyzing the directional and preliminary diagnoses of patients (acute infectious gastroenteritis, enterocolitis, hemocolitis), it was not possible to identify significant differences in the groups. The main diagnoses in the first group of children were gastroenterocolitis caused by CPF and viral diarrhea in combination with UPF: 59.4% and 21.9%, respectively. In the age group from 6 to 12 months, diagnoses of campylobacteriosis and gastroenterocolitis caused by CPF prevailed. For the third group of children,



the most frequent diagnosis was viral diarrhea in combination with UPF. The etiology of viral diarrhea was confirmed by EIA and PCR, bacterial intestinal infections were detected by bacteriological method. Structure of clinical diagnoses reporting the severity of the disease, it should be noted that in the studied groups of patients, moderate forms of the disease prevailed over severe (97.1% vs. 2.9%). Artificial feeding can play a significant role in the development of intestinal infections, in mixed - 21.9% of children in the first and 37.5% in the second group. Acute onset of the disease was noted in all groups. In addition to the presence of blood in the stool, the peculiarities of the onset of the disease in children of the first group include the fact that with severe intoxication syndrome (56.3% of children) there was no high fever. The most common symptom was bloating (37.5%). Children aged 6 to 12 months in the first days of the disease showed the following symptoms in the clinical picture: frequent increase in body temperature (38.0 ± 1.1), bloating and intoxication syndrome (45.8% and 33.3%, respectively). In the age group of 1-2 years, the onset of the disease occurred with fever above 38.0° in 69.7% of cases.

In the biochemical analysis of blood in patients, inflammatory changes were manifested by an increase in the level of C-reactive protein in 71% of patients, with an average value of 23.91 ± 24.17 mg/l (at N up to 8.2 mg/l), leukocytes — 69% of children in the general blood test with an average value of $11.58 \pm 3.52 \times 10^3$ / ml, platelets in 26% of patients (mean value $323.97 \pm 85.06 \times 10^3/\mu\text{l}$). 78% of patients had an increase in the relative number of rod-shaped neutrophils, the average value of which was $10.95 \pm 0.4\%$, with an

average relative number of neutrophils of $59.02 \pm 0.6\%$. It turned out that inflammation in acute hemocolitis is characterized by an increase in the level of C-reactive protein, leukocytes, the relative number of rod-shaped neutrophils, but not the total number of neutrophils, which may be associated with age-related changes in the hemogram of children. Intercurrent diseases were detected in 41.3% of cases: ARVI — 34% of children, less often pneumonia — in 7.3% of patients. The duration of hospital stay in patients with acute hemocolitis averaged 6.9 ± 0.3 days. Among 47 patients with deciphered etiology of AKI with hemocolitis, 17 (36%) had shigellosis, 14 of them had *Shigella flexneri*, 3 had *Shigella sonnei*. In 14 patients, tenesmus was expressed, while half of these patients required a surgeon's consultation. Mesadenitis was detected in 8 patients with ultrasound. The stool was sparse, with a lot of cloudy mucus, streaked with blood. It is important that in our observation, infectious hemocolitis developed in children over the age of 7 years only with verified shigellosis. Also, almost all observed cases of severe forms were represented by shigellosis. Salmonellosis was also diagnosed in 17 (36%) children (Fig. 1), mainly aged 1 to 3 years of life (13 patients), only 1 child aged 10 months, and 3 — aged 3 to 5 years. *Salmonella enteritidis* was isolated in 14 children, *Salmonella typhimurium* was isolated in 3 children. All patients had intoxication lasting more than five days, febrile fever, abdominal pain, vomiting in 12 children, and mesadenitis in 5. In most cases, the frequency of stool was more than 5 times a day, by nature the stool was abundant, liquid, green, fetid, with mucus and streaks of blood. In 1 child aged 3



years, salmonellosis proceeded in severe form, complicated by nodular erythema and toxic-allergic skin rash. There were 5 (11%) children with campylobacteriosis, mostly under the age of 3 years. Campylobacteriosis was manifested in all children with acute hemocolitis, except for 1 child aged 4 months who had gastroenterocolitis. In 4 out of 5 patients with campylobacteriosis, ultrasound revealed mesadenitis. *Cl. difficile* infection was established in 4 patients with hemocolitis based on the detection of toxins A and B *Cl. difficile* in feces by the EIA method: two children under the age of 1 year of life, 2 children under the age of 2 years; all these children had enterocolitis by topic. Klebsiellosis (*Klebsiella pneumoniae* infection was isolated) was diagnosed in 3 (6%) children of the first year of life and proceeded according to the type of enterocolitis in a moderate form. *Yersinia enterocolitica* was sown in feces in 1 child at the age of 5 months. Yersiniosis in the patient was in severe form, with neurotoxicosis, febrile fever lasting more than 10 days, exanthema, enterocolitis, hemocolitis. All patients received therapy in accordance with the standards of medical care for patients with intestinal infections in the hospital. The results of the clinical and laboratory analysis in children showed that the structure of patients hospitalized with hemocolitis is often dominated by etiology- infectious causes. Only 4 patients aged 12 years and older had a different cause (inflammatory bowel disease in 3 children, anal fissure in 1 child). The age profile of infectious hemocolites was dominated by young children under 3 years of age (77%), which is consistent with the data of other studies. Among children over the age of 7, an

infection-shigellosis - was diagnosed in almost all cases. In 34% of cases, the etiological structure of HC was established, salmonellosis (36%) and shigellosis (36%) prevailed. In our study, the proportion of campylobacteriosis and *Cl. difficile* infections in the etiological structure of acute intestinal infection with HC were 11% and 9%, respectively, in 6% of cases klebsiellosis was detected (in children of the first year of life), in 1 child aged 5 months - yersiniosis. In most cases (66%), we were unable to decipher the etiology of bacterial acute intestinal infection with hemocolitis. It is known that hemocolitis can also develop in other infections -some escherichiosis, parasitosis, etc. Most of our observations were patients of early age up to 3 years; it can be assumed that acute hemocolitis with acute intestinal infection of unknown etiology could be caused by enterohemorrhagic *escherichia* or conditionally pathogenic flora. Despite the fact that acute intestinal infection with hemocolitis more often occur in moderate forms, such patients are hospitalized in an infectious hospital. Acute hemocolitis occurs with intoxication and febrile fever, and in some cases observed by us and in severe forms with the development of neurotoxicosis. The severe form was found in 5.8% of cases, in the vast majority -with shigellosis. Symptoms of intoxication and febrile fever were expressed in all patients with infectious hemocolitis; abdominal pain - in 94%, stool with pathological impurities with a frequency of more than 5 times a day - in 84%, vomiting - in 28.5%, mesadenitis with ultrasound - in 15% of cases. Exicosis of the 1st or 2nd degree was detected in 64% of cases. We observed the addition of intercurrent diseases (ARVI, pneumonia) in 41.3% of children.



Infectious acute hemocolitis is characterized by the development of local and systemic inflammation. In our study, in 71% of cases, an increase in C-reactive protein was detected - 23.91 ± 24.17 mg/l, in 69% — leukocytosis — $11.58 \pm 3.52 \times 10^3$ /ml, in 78% — an increase in the relative number of rod-shaped neutrophils in the general blood test. Thrombocytosis was detected in 26% of the blood, which reflects the level of inflammation in infectious acute hemocolitis. Based on the data obtained, the following can be done:

conclusions

Given the relatively high proportion of unencrypted hemocolites, in practice it is necessary to expand the possibilities of laboratory diagnostics of bacterial intestinal infections with acute hemocolitis using modern methods (PCR and others). It is also necessary to remember that hemocolitis can be the debut of the development of inflammatory bowel diseases, and if necessary, additional instrumental studies in the field of diagnostics should be carried out.

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