

## ACUTE INFECTIOUS DIARRHEA IN CHILDREN

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**Abstract.** *This article is devoted to the problem of acute diarrhea in children, especially the study of cause-and-effect factors and clinical features of acute diarrhea in young children. The research was conducted among 225 children aged from 4 months to 3 years who were hospitalized at the 4th Children's Infectious Diseases Hospital in Tashkent and in the intestinal department of the NIIEMIZ clinic.*

*The etiological structure of acute diarrhea in 42% - 45% of cases was established by the bacteriological method, from 80% - 98% using PCR, the dominant role of viral-bacterial associations of pathogens, antibiotic resistance of "hospital" strains, including Salmonella typhi murium, should also be taken into account.*

**Keywords:** *acute diarrhea; clinic; diagnostics; young children; treatment; outcomes.*

**Introduction.** The importance of infectious pathology, as one of the main criteria of health and, consequently, the sanitary and epidemiological well-being of the population, is recognized as a priority area of Healthcare. Among infectious diseases, acute diarrhea is one of the most common pathologies of the population of the Republic. The daily practice of pediatricians shows that the infectious cause of acute diarrhea in children dominates over others. Infectious diarrhea is the second leading cause of morbidity and mortality worldwide. In developing countries, up to three episodes of diarrhea are observed annually among children under 3 years of age [4,5,6,7,8,9]. According to WHO data, in 2010. Globally, 58% of deaths in children under 5 years of age were due to infectious diseases, including 11% due to diarrheal infections [1,2,3,10,11,13]. In the European Region, acute diarrheal infections accounted for 13% of deaths in children under 5 years of age [12,14]. Currently, through the efforts of the World Health Organization, the closest attention is paid to solving this problem, and the statistics of OD diseases in children in both developed and developing countries of all world regions is under constant monitoring by WHO [4,15,16]. According to the classification proposed by WHO, there are 3 forms of diarrhea: acute, refractory and bloody diarrhea. Management of each of these forms of diarrhea should prevent or control the underlying danger associated with them. The diagnosis of "acute diarrhea" is collective and combines a number of etiologically different, but pathogenetically and clinically similar diseases. Etiological decoding, on the one hand, makes the diagnosis late, and on the other, insufficiently substantiated, since etiotropic therapy for acute diarrhea is carried out for invasive diarrhea [16,17,18,19]. It must be borne in mind that even in qualified laboratories of infectious diseases hospitals or clinics, the isolation of a culture of pathogenic and opportunistic bacteria from the patient's feces in the first three days of illness is successful on average at 38-42%. The doctor needs early diagnosis to carry out pathogenetic therapy, which in many cases becomes urgent.

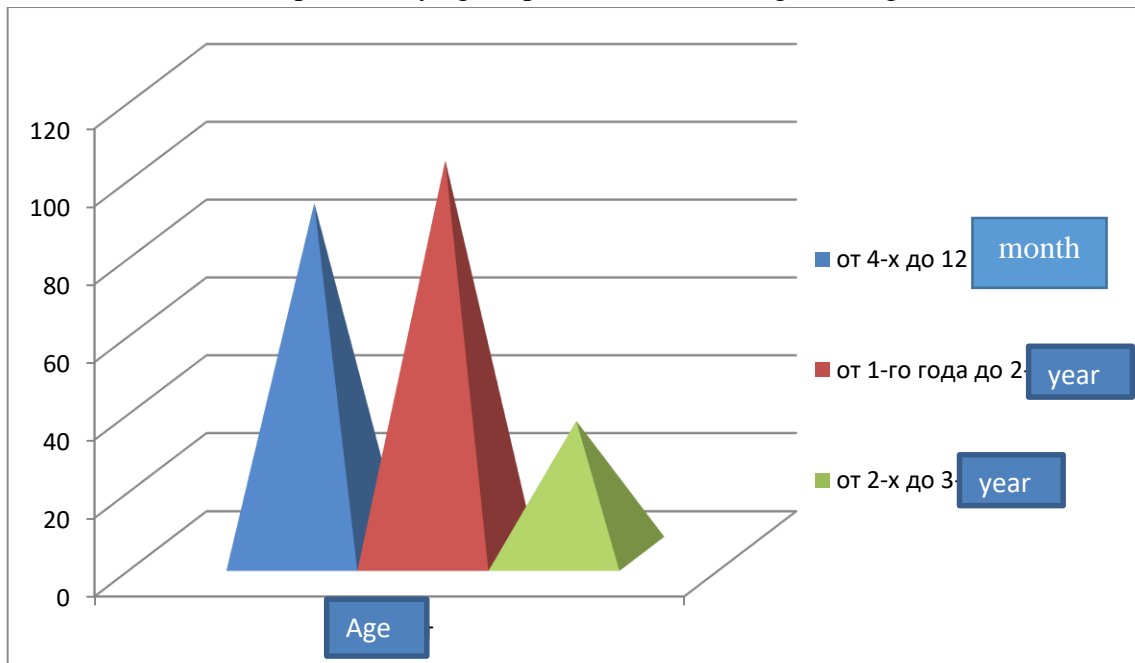
The purpose of the study was to study the cause-and-effect factors and clinical features of acute diarrhea in young children.

**Materials and methods of research:** The object of the study was observations of 225 children aged from 4 months to 3 years who were hospitalized at the 4th Children's Infectious

Diseases Hospital in Tashkent and in the intestinal department of the NIIEMIZ clinic. In the hospital, studies were carried out using general blood, urine and stool tests in all patients. In parallel with these studies, a bacteriological study of feces was carried out before the start of treatment and after its completion. During the primary sampling, the material was collected using a rectal swab, immediately immersed in Teague preservative. During the secondary collection, fresh feces obtained during defecation were inoculated. To determine the etiology of pathogens of acute intestinal infections, bacteriological, serological (ELISA) and immunological (PCR) methods were used. When conducting the study, the age of the children, their premorbid condition, the nature of feeding and the type of infectious agent were taken into account. The diagnosis of acute diarrhea was established on the basis of epidemiological data, clinical signs of general infectious syndrome (fever, symptoms of intoxication), gastrointestinal tract syndrome (abdominal pain, nausea, vomiting, diarrhea), dehydration syndrome, taking into account clinical recommendations (treatment protocols) providing medical care to patients with this pathology.

Study results: Among 225 children diagnosed with acute diarrhea who were under observation, there were 140 (62.2%) boys and 85 (37.8%) girls, which indicates that boys are more susceptible to this disease.

The distribution of patients by age is presented in the diagram (Fig. 1).



**Rice. 1. Distribution of patients by age.**

Analysis of the data presented in the diagram shows that there were 90 (40%) children aged from 4 to 12 months, from 1 year to 2 years – 101 (44.9%), from 2 up to 3 years – 34 (15.1%). Which, first of all, indicates that the risk of developing diarrhea is directly related to the age of the child - the younger the age, the higher the risk of developing diarrhea. A comparison of the age composition of patients with monoinfections and mixed infections showed a clear predominance of children in the first year of life, including those under the age of 6 months - with mixed infections.

Analysis of clinical observations made it possible to establish that the disease proceeded predominantly as gastroenterocolitis, with moderate forms of the disease predominant (in 74.1%). Severe forms were noted in 25.9% of children with the development of toxicosis and exicosis of the third degree in patients. When studying concomitant pathologies in all children, we identified

anemia of varying degrees ( $p>0.05$ ), rickets ( $p>0.001$ ), fermentopathy and intestinal dysbacteriosis from birth, perinatal encephalopathy ( $p>0.05$ ) more often with hypertension syndrome.

Analysis of the distribution of patients according to the form of the disease according to the WHO classification (acute diarrhea, refractory and bloody) in our studies showed that acute diarrhea was observed in 113 (50.2%) cases, refractory in 63 (28%) and refractory in 49 (21.8%) - bloody, which indicates that acute diarrhea develops more often, while cases of bloody diarrhea are the most rare. Our analysis of the interdependence of the form of the disease and the timing of patients' admission to hospital treatment revealed that the acute onset of the disease, and therefore the admission of patients to the hospital during the first three days from the moment of its onset, prevailed among patients with acute diarrhea - 73 cases or 64.6% of the total number of cases with this form of the disease, which amounted to 57.9% of the total number of admissions during this time period - 126 patients. Among them, 30 (47.6%) patients were identified with refractory diarrhea, and 23 (46.9%) with bloody diarrhea. In the total number of admissions on days 4-7, cases of acute diarrhea also predominated, they amounted to 33 patients, that is, 29.2% of all patients with this form of the disease or 54.1% of the total number of admissions - 61 patients. During this time period, 15 (23.8%) patients were admitted with refractory diarrhea, and 13 (26.5%) with bloody diarrhea. Among those admitted for periods of more than 7 days from the onset of the disease, refractory diarrhea predominated - 18 cases or 28.6% of the total number of cases with this form of the disease, which amounted to 48.6% of the total number of admissions - 37 patients, which indicates a more frequent hidden onset of the disease in this form. During this time period, 7 (6.2%) patients were admitted with acute diarrhea, and 12 (24.5%) with bloody diarrhea. We identified patients who were admitted again (with relapse of the disease) into a separate group. Among patients in this group, refractory diarrhea also prevailed - it amounted to 44 cases, that is, 69.8% of both the total number of patients with this form of the disease and the total number of newly admitted patients - 63 patients. Analysis of cases of relapse of the disease among patients with acute diarrhea identified 7 (6.2%) patients, among patients with bloody diarrhea - 12 (24.5%). The results of pharmacotherapy in this group differed from the results in all other groups in that repeated administration of antibiotics to such patients did not lead to improvement, but to a worsening of their condition. The etiology of pathogens in 42% - 45% of cases was established by bacteriological method, from 80% - 98% using PCR. The use of coprofiltrate proved to be effective for the effectiveness of PCR analysis.

Analysis of the obtained data from a bacteriological study of feces for the intestinal group showed the high resistance of most pathogenic pathogens to antibiotics, which contributes to the increase in dysbiosis and nosocomial infections among children due to resistant hospital strains. Research conducted in the clinic revealed the highest antibiotic resistance of "hospital" strains of *Salmonella typhi murium*.

A factor predisposing to the intrahospital spread of this pathology should include noticeable disturbances of the intestinal microbiocenosis in children, especially those treated for a long time and repeatedly with antibiotics on an outpatient and inpatient basis.

Analysis of the results of bacteriological studies in comparison with the forms of the disease revealed a certain picture of interdependence, presented in Fig. 2.



***Rice. 2. Interdependence of nosologies of pathogens and forms of the disease***

As can be seen in this diagram, dysentery was most common among cases of acute (29 (25.7%) cases) and bloody (23 (46.9%) cases) diarrhea, while escherichiosis and clostridia, in the vast majority of cases, occurred in acute diarrhea (28 (24.8%) cases of escherichiosis and 26 (23.0%) cases of clostridia), but such pathogens as salmonellosis and acute intestinal infections of unknown etiology (26 (41.3%) cases of salmonellosis and 20 (31, 7%) cases of acute intestinal infections of unknown etiology), were most often detected with refractory diarrhea.

According to our clinical material, the observed mortality in acute intestinal infections over the past 10 years has remained consistently low and amounted to 0.1%. Our analysis of 15 deaths due to acute diarrhea revealed: an increase in the number of cases of acute diarrhea of the gastroenteritis type with the addition of pathogens - MS viruses, adenovirus, influenza, parainfluenza (6 cases in total); increase in the proportion of children suffering from anemia (8 cases); an increase in the proportion of children aged from 1 month to 6 months (9 cases), of which in 6 cases children were bottle-fed, which indicates a possible increased risk of infection with pathogenic pathogens through synthetic (artificial) food products. Consequently, the importance of natural nutrition in protecting a child's health remains obvious.

The causes of death in acute diarrhea were: infectious-toxic shock - in 7 cases (46.6%); pulmonary edema – in 12 cases (80%); degeneration of parenchymal organs – in 6 cases (40%); DIC – in 8 cases (53.3%); cerebral edema – in 3 cases (20%); pneumonia – in 5 cases (33.3%).

The presented data indicate that, along with cases of severe OD, which are associated with a burdened premorbid background or co-infection with several pathogens, there are deaths that are not associated with factors available for verification that aggravate the course of the disease. It is possible that in these cases the individual characteristics of the organism play a key role.

Based on the analysis of fatal cases, the dominant role of the viral-bacterial association of acute diarrhea should be taken into account.

**Conclusion.** The results of our research show that diarrhea is most common in young children, the development of the initial period of the disease is sometimes hidden, 80.0% of deaths are caused by pulmonary edema, 46.6% by infectious toxic shock. Especially in severe cases, with refractory and bloody diarrhea in children, the dominant role of viral-bacterial associations of

pathogens, as well as the antibiotic resistance of “hospital” strains, including *Salmonella typhi* murium, should be taken into account.

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