EPIDEMIOLOGICAL FEATURES OF THE COURSE OF ACUTE INTESTINAL INFECTIONS CAUSED BY ESCHERICHIA IN CHILDREN

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Abstract. *Clinical, epidemiological and laboratory microbiological analysis shows that diarrhea of Escherichia etiology is characterized by: seasonality; gastroenteritis clinic with moderate or mild pain syndrome; the nature of the stool (mostly watery, yellow, greenish-yellow in color without pathological impurities) and the localization of pain in the epigastric and/or umbilical areas; more rumbling in the stomach, mild or moderate signs of dehydration and/or intoxication; the presence of catarrhal symptoms; absence of inflammatory changes in the hemo- and coprogram; predominantly moderate course of the disease with a duration of 3 to 5 days.*

Keywords: *nosological units, polyetiology, Escherichiosis, ariability.*

Actuality of study. Diarrheal diseases are an important problem in practical medicine, often leading to errors in diagnosis, choice of treatment, and management tactics. The polyetiology of diarrheal diseases in the presence of identical manifestations underlies diagnostic errors. Therefore, an infectious disease doctor must have an understanding of all types of diarrhea, naturally, including infectious ones. According to the recommendations of the World Health Organization (WHO), acute diarrhea should be understood as watery, loose stools with a frequency of more than 3 times a day (more than 200 g/day) or loose, bloody stools with a frequency of more than 1 time per day. Acute diarrhea is one of the most common diagnoses in general, pediatric and family practice. In industrialized countries and regions, wasps develop in 0.5-2 cases per capita per year. For example, in the United States, more than 100 million cases of OD are registered annually, which account for 25% of all hospitalizations. In developing countries, about 1 billion cases of OD are registered annually, leading to the death of 2-2.5 million children under the age of 5 years. Thus, ML causes damage to the most able-bodied population and children, causing enormous social and economic damage.

The number of clinical forms of acute intestinal infections exceeds 30 nosological units, the causative agents of which can be bacteria, viruses and protozoa [6, 12, 14]. The range of bacteria that can cause diarrheal diseases is very large; these include enterovirulent strains of Escheichia coli.

Currently, Escherichia infection has a significant share in the structure of acute intestinal infections (up to 14.6% of cases) [5, 11, 54]. Escherichiosis is an acute anthroponotic disease caused by diarrhetic E. coli.1 It occurs with a clinical picture of acute gastroenteritis or enterocolitis, most often with severe intoxication and dehydration. Pathogenic Escherichia (according to the WHO classification - “diarrheagenic”) differ from non-pathogenic ones in their antigenic structure and the presence of pathogenicity factors, which are characterized by large ranges of ariability (adhesiveness, invasiveness, ability to form toxins, etc.). Depending on the antigenic structure of O-, H- and K-antigens and the presence of a certain set of pathogenicity factors (invasiveness, production of toxins, etc.) that determine the features of pathogenesis and clinical manifestations, all Escherichia and the diseases caused by them are divided into groups.

There are 5 known categories of E. coli: Enterotoxigenic, enteroinvasive, enteropathogenic, enterohemorrhagic, enteroadhesive and enteroaggregative [13]. The source of infection is sick people, less often carriers. The mechanism of transmission of the pathogen is fecal-oral, the route of transmission of the pathogen is mainly food (up to 88% of cases) [16]. A significant proportion (10-30.0%) of Escherichia among the causative agents of nosocomial pneumonia [13]. E. coli is often involved in spontaneous infection of ascitic fluid in persistent liver cirrhosis. Escherichiosis caused by E. coli 0157:HA strains is especially difficult clinically. The mortality rate from this infection is 2.5%, and in the case of complications occurring in the form of hemolytic-uremic syndrome and thrombocytopenic purpura, it reaches 5.0% or more.

The purpose of study: to study the clinical features of mono- and mixed infections of acute diarrhea caused by various serogroups of Escherichia.

Materials and methods of the study:

63 sick children aged from 3 months to 3 years were examined, of which 51 were diagnosed with Escherichia infection and 12 were in the control group. Using specially developed maps, the semiotics and dynamics of the clinical course of the infectious process, the nature and types of gastrointestinal lesions and the effectiveness of the therapy were studied. Conventional comprehensive examinations were carried out, including a general urine test, a clinical blood test, and a scatological examination. All examined patients were subjected to a thorough bacteriological and serological examination for differential diagnostic purposes. The state of colon microbiocenosis was assessed based on the results of inoculating feces on differential diagnostic nutrient media.

The collection of clinical material was carried out at the clinic of the Scientific Research Institute of Microbiology, Epidemiology of Infectious Diseases and the 4th city children's infectious diseases hospital in Tashkent. A total of 63 sick children aged from 3 months to 3 years were examined, of which 51 were diagnosed with Escherichia infection and 12 were in the control group. Using specially developed maps, the semiotics and dynamics of the clinical course of the infectious process, the nature and types of gastrointestinal lesions and the effectiveness of the therapy were studied. Depending on age, the subjects were divided into groups.

Age-gender structure

Total	Age in years			Gender	
sicks	3 months -1	1-2	2-3	boys	girls
63 100%	24 %	31 %	8 %	38 %	25 %

As can be seen from Table 2.1.1, the average age of the children was 14.0±8.34; Boys predominated by gender. The study of the epidemiological history made it possible to establish contact transmission of infection in 16 (25.4%), food - in 33 (52.4%) patients; in 14 (22.2%) children it was not possible to identify the source of infection.

The etiology of causative agents of Escherichia infection in 37 (72.5%) sick children was established by bacteriological research. 19 patients underwent PCR diagnostics. At the same time, the causative agent of escherichiosis was identified in 14 (27.5%) patients.

The table data also shows that of the 5 categories of E.coli (enterotoxigenic, enteroinvasive, enteropathogenic, enterohemorrhagic and enteroaggregative), in our observations EPE and ETE were more common, and patients with EIE were less common. In 14% of patients, non-typing antibiotic-resistant strains of Escherichia were isolated.

Etiological structure of Escherichia infections

Total	Etiological interpretation of the diagnosis (n = 51)		Etiological decoding by O-antigen group (N-37)			
	Bacteriological	PCR diagnostics	ETE epigenetic theory of evolution	EP Endoscopic polypectomy	EIE enteroinvasive escherichiosis	Non-typing E
51 100%	37 72,5%	14 27,5%	13 35%	15 40%	4 11%	5 14%

In enteropathogenic escherichiosis, Escherichia serovars 055, 0117, 044, 018, 0126, 0142, 0114, 0127 were mainly isolated. In enterotoxigenic escherichiosis, Escherichia serovars 0128, 020 and 075 were identified. In enteroinvasive escherichiosis, 2 serovars were identified: 0143, 0151. Escherichia serovars 020, 0114, 0143 and 044 occurred in a moderately severe form of the disease. In severe cases, Escherichia serovars 055, 011, and 0151 were more often recorded.

In our patients, enterohemorrhagic and enteroaggregative types of Escherichia were not identified.

When studying the microbial landscape of feces of patients with escherichiosis, numerous microbial associations of opportunistic microbes and viruses were identified in 37.3% of children.

Frequency of isolation of FPP (Flocculant preparation plant) and viruses during Escherichia infection

Total sicks	Name of the identified microbial associations					
	Compan viruses	Nora viruses	Entero Bacter	Citro bacter	Staphylococcus aureus	Klebsiel la
19 100%	4 21%	6 31,5%	2 10,5%	3 16%	1 5%	3 16%

As can be seen from the table, noraviruses, rotaviruses, Citrobacter and Klebsiella as accompanying flora were found in large quantities. At the same time, there were no significant differences in the distribution of patients depending on the age of the children. However, it should be noted that the association of microbes was twice as high among children from three months to two years. Seeding of these microorganisms may be the result of endogenous infection (activation of endogenous flora) against the background of changes in the pH of the environment during the inflammatory process caused by undoubtedly pathogenic microorganisms.

To conduct a comparative analysis of the clinical course of Escherichia infection, three groups of children were identified during the examination:

1. The main group of patients with Escherichia infection (n = 32)

2. Comparison group of patients with mixed infection (escherichiosis + FFP + viruses) (n = 19)

3. Control group – patients with acute intestinal infections of unknown etiology (n = 12).

In most cases, 84.4% of sick children were hospitalized in the first week of illness, which made it possible to conduct a clinical study and begin treatment in the early stages of the disease.

56 (88.8%) children were admitted to the hospital with an acute onset of the disease. Of the 63 patients, 58 (92%) of those examined were diagnosed with a moderate form and 5 (8%) with a severe form. Among the examined patients, patients with a moderate form of the disease predominated.

When distributing patients depending on the type of feeding, it was revealed that in most cases the children were mixed-fed - 35 (56%), breastfed - 18 (28%), and bottle-fed - 10 (16%). The premorbid background of all 100% of children is burdened with concomitant diseases. We characterized the above parameters of the comparison group in the table

Comparative characteristics of groups of children.

Comparable parameters	Main group n- 32		Compare group n-19		Control group n-12	
	abs	%	abs	%	abs	%
Age:						
Up to 1 year	11	34,4	9	47	5	42
From 1 year to 2 years	19	59,4	8	42	5	42
From 2 years and more	2	6,3	2	11	2	16
Gender: boys	22	68,8	10	53	7	58
girls	10	31,2	9	47	5	42
Duration of hospitalization	19	59,4	10	-	7	58
1-3 days of illness	8	25,0	5	-	3	26
4-6 days of illness	5	15,6	4	-	2	16
7 or more days						
Severity of the current:						
Lightweight	-	-	-	-	-	-
Medium-heavy	27	84,4	19	100	12	100
Heavy	5	15,6	-	-	-	
Begin: acute	32	100,0	12		10	84
gradual	-		7		2	16
Outcome of the disease:						
recovery	20	62,5	10		4	33.4
Improvement	12	37,5	9		8	66.6
mortality	0	0	0	0	-	

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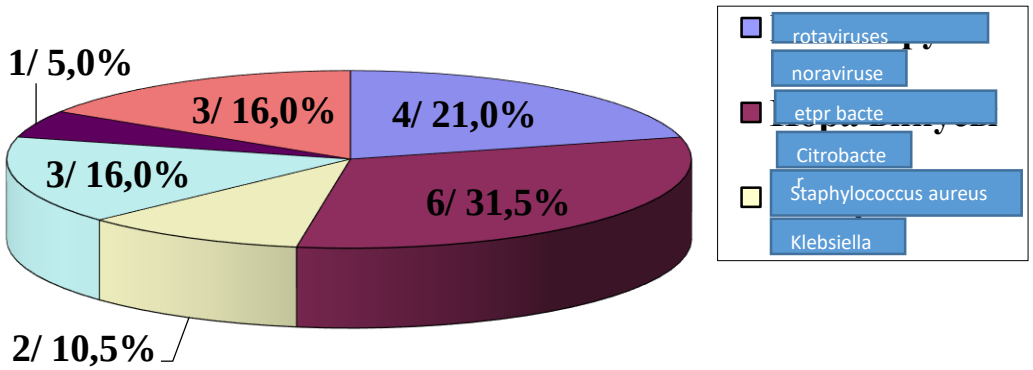
Frequency of isolation of FPP and viruses during Escherichia infection



As can be seen from the figure, noraviruses, rotaviruses, Citrobacter and Klebsiella as accompanying flora were found in large quantities. There were no significant differences in the distribution of patients depending on the age of the children. However, it should be noted that the association of microbes was three times higher among children from three months to two years. Seeding of these microorganisms may be the result of endogenous infection (activation of endogenous flora) against the background of changes in the pH of the environment

Infection of the gastrointestinal tract in 43.8% of cases occurred as a result of the development of Escherichia gastroenteritis caused by polyresistant pathogens in the table

Indicators of bacterial studies in multidrug-resistant escherichiosis

	Number of patients			
		EPIT	ENIT	ETI
	n= 32	n= 12	n= 16	4
Gastritis	12/37,5	2/16,7		
Gastroenteritis	14/43,8	89/66,6	4/25,0	2/50,0
Enterocolitis	6/18,7	2/16,7	9/46,3	1/25,0

Enteropathogenic pathogens caused the development of gastroenteritis in (66.6%); enteroinvasive pathogens caused enterocolitis and colitis in 56.3% of cases. Repeated vomiting was observed, lasting 8.4 ± 1.2 days. 34.4% of sick children were restless for 7 or more days due to abdominal pain. 37.5% of patients developed signs of hepatomegaly, and 9.4% developed signs of hepatosplenomegaly.

Along with signs of infection of the gastrointestinal tract, hypertensive syndrome was identified in patients, nervous symptoms were identified, circulatory disorders in the cardiovascular system (increased heart rate, pallor and cyanosis of the skin, muffled heart sounds,

etc.) are of great importance in the diagnosis of escherichiosis caused by multidrug-resistant strains. The disease proceeded in a typical form, without relapses or exacerbations.

Our results show that in 76.5%) children the symptom of abdominal pain localized in the middle of the abdomen (near the navel) and intestinal rumbling (70.5%) were palpated. Flatulence in our sick children was also a fairly common symptom (76%). As noted in the literature, it is based on enzymatic insufficiency of the small intestine and pancreas, while the breakdown of carbohydrates is disrupted with the subsequent development of fermentative dyspepsia.

Conclusion: Our clinical, epidemiological and laboratory microbiological analysis shows that diarrhea of Escherichia etiology is characterized by: seasonality; gastroenteritis clinic with moderate or mild pain syndrome; the nature of the stool (mostly watery, yellow, greenish-yellow in color without pathological impurities) and the localization of pain in the epigastric and/or umbilical areas; more rumbling in the stomach, mild or moderate signs of dehydration and/or intoxication; the presence of catarrhal symptoms; absence of inflammatory changes in the hemo- and coprogram; predominantly moderate course of the disease with a duration of 3 to 5 days.

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