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Bacterial intestinal infections in young children, taking into account sensitivity to antibiotics

Nassakayeva Gulmira
NJSC "Medical University of Karaganda" Kazakhstan

Acute intestinal infections are widespread in the world; the incidence rate and incidence of adverse outcomes in children is higher than in the adult population.

The etiology of acute intestinal infections in most cases is represented by viral and bacterial pathogens, protozoa. A wide range of diseases can be accompanied by the manifestation of hemocolitis. Infectious causes of hemocolitis include bacterial infections and helminthiasis.

The issue of bacterial intestinal infections remains relevant. Currently, there are a number of problems in the treatment of bacterial diarrhea. The first problem is bacteriological examination, due to its duration and the need to conduct it before starting antibiotic therapy.

The second therapeutic problem is the variability of pathogens to antibiotics, which are widely used in treatment, as well as the growth of antibiotic-resistant strains of pathogens.

The problems of antibacterial drugs in the treatment of acute intestinal infections in children are indicated only for moderate and severe forms of invasive diarrhea. Antibiotics are not indicated for viral diarrhea, as they worsen the condition of the intestinal microbiocenosis and prolong the period of convalescence.

Objective

To study bacterial intestinal infections in young children, taking into account sensitivity to antibiotics in the infectious diseases hospital of Karaganda.

Materials and research methods

The research materials are the stories of 100 patients aged from 1 month to 12 months in the children's intestinal department in the infectious diseases hospital of Karaganda for the period 01/01/2023 - 06/30/2023. The research method is a retrospective analysis of medical history through the hospital information system, as well as a review of literature data.

For etiological diagnosis, bacteriological examination of stool was used. Also, all patients were examined routinely (complete blood count, urinalysis with acetone, coprogram).

Results and discussion

Patients were divided by gender, where females accounted for 49% (n-49), males - 51% (n-51). Thus, no obvious differences by

gender in the development of ACI were identified.

The duration of hospitalization varied from a minimum of 4 to 32 bed days, and also depended directly on the severity of the patients' condition. The average severity of the disease was 94% (n-94) of cases, while the severe form was 6% (n-6).

The etiological decoding of acute intestinal infections showed that in children under 1 year of age, opportunistic flora predominates, such as: Citrobacter diversus, Citrobacter freundii; Citrobacter farmer; Enterobacter aerogenes; Enterobacter cloacea;Hafnia alvei; Hafnia alvei+Pseudomonas aeruginosa; Klebsiella oxytoca; Klebsiella pneumonia; Morganella morganii; Proteus mirabilis; Proteus vulgaris; St. aureus. The causative agents of severe forms of acute intestinal infections requiring transfer to the ICU were Klebsiella oxytoca, Morganella morganii, Citrobacter freundii, Klebsiella pneumonia.

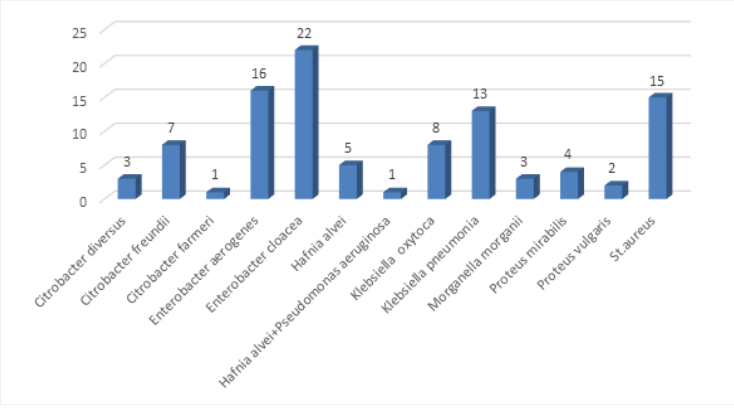

Diagram 1.

The main clinical indicators when collecting anamnesis of children are presented in Table 1 with clear numerical values. Indicators such as: high body temperature, frequency of stool depended on the severity of the patients' condition. According to the localization of the pathological process, gastritis and gastroenteritis predominated. According to the data identified, the type of feeding did not affect the development of intestinal infection.

Indicator	Indicator values			
Height of body temperature,degrees ©	36,6- 37,9 – 60% (n-60)	38,0-38,9- 29 % (n-29)	39- 40,2 – 11% (n-11)	-
Stool frequency upon admission	55% (n-55)	37% (n-37)	from 10 and higher - 8 (n-8%)	-
Vomiting on admission	from 0-5 76% (n-76)	from 5-10- 20% (n-20)	from 10 and higher - 4 (n-4%)	-

Hemocolitis is one of the emergency conditions that require qualified medical care and comprehensive laboratory and instrumental diagnostics. In this study, hemocolitis was detected in 16% (n-16) of cases.

When making a preliminary diagnosis of intestinal infection, all incoming patients are assessed for the degree of dehydration. In hospitalized children, the first degree of exicosis prevailed - 66% (n-66), less often - the second degree - 5% (n-5). Patients were admitted without signs of exicosis in 29% (n-29), and severe, i.e., third degree exicosis was completely absent. This is rather due to a successful outpatient oral rehydration therapy program.

Analysis of the hemogram of children under one year of age did not reveal significant changes, as presented in Tables 2,3,4. Signs such as hyperleukocytosis and neutrophilia, characteristic of a bacterial infection, were found only in severe acute intestinal infections.

Table 1:

	Indicator values				
Indicator	3 до 6,9	07-Sep	9,1- 12	12,1-16	16,1- 27,7
Leukocytes (10*9)	N-14 (14%)	N- 23 (23%)	N- 30 (30%)	N-23 (23%)	N-10 (10%)

Table 2:

	Indicator values				
Indicator	16- 30	31-44	45-60	61-74	75-87
Neutrophils (%)	N-24 (24%)	N-25 (25%)	N- 22 (22%)	N-25 (25%)	N-4 (4%)

Table 3:

	Indicator values				
Indicator	10- 30	31-44	45-60	61-77	75-87
Lymphocytes (%)	N-24 (24%)	N-25 (25%)	N-22 (22%)	N-29 (29%)	N-4 (4%)

The frequency of registration of acetonuria was detected in 26% (n-26). The topical diagnosis of ACI correlated with the presence of acetonuria. Vomiting is usually regarded as a manifestation of gastritis and gastroenteritis. Therefore, acetonuria was more often recorded in gastric and gastroenteric variants of acute intestinal infection.

In this sample, the course of intestinal infections was assessed, both with and without complications. In 68% (n-68) of cases the disease proceeded without complications. In 32% (n-32) of cases, various complications occurred, occurring both independently and in combined form, such as: nonspecific reactive and toxic hepatitis, acute pyelonephritis, community-acquired pneumonia, sepsis, septicemia, genitourinary tract infection. In the observed children, complications from the genitourinary system predominated, which is presented.

6% (n-6) of the total number of analyzed patients required transfer to the ICU. The severity of the course was due to pronounced changes in clinical and laboratory parameters and the presence of complications. All patients with severe acute intestinal infection had concomitant background pathologies, such as iron deficiency anemia, rickets, protein-energy deficiency and atopic dermatitis.

In etiotropic therapy, antibacterial agents were used, taking into account sensitivity based on the results of bacteriological culture of stool. 93% (n-93) of cases required antibiotic therapy, and 7% (n-7) did not. Dual antibiotic therapy was carried out in n-34% (n-34) of cases, and in 66% (n-66) it was not required. For antibacterial therapy, the main groups were taken with the definition

of sensitivity and resistance:

Cephalosporins (S-30, R-70);

Carbapenems (S-98, R-2);

Macrolides (S-43, R-57);

Aminoglycosides (S-100, R-0);

Fluoroquinolones (S-94, R-6);

- from which we can conclude that UPF in general is most sensitive to carbapenems, aminoglycosides, fluoroquinolones and less sensitive to cephalosporins and macrolides.

Conclusion: Thus, acute bacterial intestinal infections remain a pressing problem in pediatrics; assessment of the etiological structure has always been and remains an important factor in the proper organization of care for infectious patients. The etiology of bacterial intestinal infections was established in all hospitalized children. 14 different combinations of bacteria were identified, with opportunistic microorganisms being more often observed. In young children, intestinal infections were caused by various pathogens. The main pathogens are conditionally pathogenic flora: Enterobacter aerogenes, Enterobacter cloace, Klebsiella pneumonia, St.aureus. The causative agents of severe acute intestinal infections were: Klebsiella oxytoca, Morganella morganii, Citrobacter freundii, Klebsiella pneumonia.

Biography

In the period from 2014 to 2016, she completed master's studies in the specialty 6M110100 "Medicine", scientific and pedagogical direction, Karaganda State Medical University (Kazakhstan). Upon completion, she defended her master's thesis on the topic: "Improving methods of treating patients with giardiasis", submitted for an academic master's degree in the specialty 6M110100 "Medicine", scientific and pedagogical direction.

In 2020, she was transferred to the position of assistant professor at the Department of Infectious Diseases and Phthisiology.

More than 30 articles and theses have been published, including in journals indexed in KOKSON and Scopus and Web of science.