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The Impact of Antibacterial Therapy on Clinical Outcomes and Intestinal Microbiota in Children with Acute Bacterial Diarrhea

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Abstract: The constant variability of microbial sensitivity to widely used antibiotics and the rise of antibiotic-resistant strains of pathogens in acute intestinal infections necessitate the use of antibacterial drugs that demonstrate the highest sensitivity to the identified pathogen while minimizing side effects [6, 8, 9]. Acute intestinal infections (AII) remain one of the most prevalent infectious pathologies in childhood, accompanied by significant morbidity and a high risk of complications [1, 2]. Alterations in the composition of the microbiota can negatively impact a child's immune status and contribute to an increased frequency of recurrent intestinal infections [7, 8].

Keywords: acute intestinal infections (AII), children, antibiotic resistance, antibacterial therapy, microbiota, etiotropic treatment, treatment optimization, pathogens.

Relevance

Acute intestinal infections (AII) remain one of the leading causes of morbidity and hospitalization in children, especially under five years of age, despite advances in modern medicine. [1, 2]. According to recent studies, acute diarrheal diseases continue to occupy a significant place in the structure of infectious pathology in childhood. [3, 4]. Antibacterial therapy is applied in moderate and severe forms of bacterial acute intestinal infections and plays an important role in reducing disease severity and preventing complications. [5, 6]. At the same time, several authors note the adverse effects of antibacterial drugs on the intestinal microbiocenosis, manifested by the development of dysbiosis and antibiotic-associated disorders of intestinal microflora in children. [7, 8]. Modern studies show that changes in the composition of intestinal microflora under the influence of antibacterial therapy can have long-term consequences for the child’s immune system and increase the risk of recurrent infections and chronic gastrointestinal diseases. [9, 10]. In addition, irrational use of antibiotics in acute intestinal infections contributes to the growth of antibiotic resistance of pathogens, which is one of the global health problems of the 21st century . Therefore, a comprehensive assessment of the clinical effectiveness of antibacterial therapy in combination with the study of its impact on the intestinal microflora in children with acute intestinal infections is of particular relevance [5, 8, 10]. Such an approach allows optimizing treatment tactics, increasing therapy effectiveness, and reducing the risk of adverse outcomes.

Objective

To determine the etiological structure of acute intestinal infections at the present stage. To evaluate the effectiveness of new-generation antibacterial drugs in the treatment of bacterial intestinal infections.

Materials and methods

To achieve this goal, a retrospective epidemiological analysis of morbidity was conducted. (2,3,5,9). In assessing the etiological significance of microorganisms isolated from the feces of patients with acute intestinal infections, quantitative indicators of microbial contamination were used as criteria.

Results and discussion

Studies show that rational use of antibacterial drugs allows shortening the duration of diarrhea, reducing the frequency of vomiting, and accelerating normalization of body temperature in children with bacterial etiology of AII. [1, 3, 4]. According to Shakhovskaya and Plakhova, [3]. in children receiving targeted antibacterial therapy, the average duration of diarrhea decreased by 1.5–2 days compared to the standard treatment group without antibiotics. At the same time, irrational use of antibiotics in viral or mild bacterial infections does not produce a significant clinical effect but increases the risk of side effects. [2, 5]. To study the quantitative and qualitative composition of aerobic and anaerobic intestinal microflora, dysbiosis studies of feces were conducted in 60 patients without manifestations of AII. The state of the intestinal microbiocenosis was determined by indicators such as the presence of bifidobacteria, lactobacilli, Escherichia coli with normal enzymatic activity, with altered enzyme function including lactose-negative biochemical variants, as well as the presence of opportunistic pathogenic microbes (OPM) and fungi.

Conclusion

The data indicate the unconditional need to develop new effective diagnostic approaches and optimize the diagnostic algorithm for diseases of this group. The widespread prevalence of morbidity, high frequency of severe forms and complications, make AII one of the most significant diseases. The timeliness and adequacy of therapy for AII determine the duration of the disease and outcomes. According to modern concepts, therapy of AII in children should be comprehensive and phased. An individual approach to drug selection should take into account etiology, severity, phase and clinical form of the disease, the child's age, and the state of microorganisms at the time of illness. Choosing optimal etiotropic therapy is challenging for physicians, and one of the important aspects is the selection of an antibacterial drug. Constant variability of microbial sensitivity to widely used antibiotics and the growth of antibiotic-resistant strains of AII pathogens dictate the need for using an antibacterial drug with the highest sensitivity to the identified pathogen and minimal side effects. Considering data on the negative impact of most antibacterial drugs on the composition of intestinal microflora, as well as the role of dysbiotic disorders in the pathogenesis of AII, antibacterial drugs affecting not only pathogenic but also opportunistic flora are of interest. Therefore, issues of improving the strategy and tactics of etiotropic therapy of bacterial AII in children remain relevant. Modern data confirm that a comprehensive assessment of clinical and microbiological indicators during antibacterial therapy in children with acute intestinal infections is a key factor for safe and effective treatment.

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