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The Course of Acute Intestinal Infections in Children Associated with Candidiasis Infection

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Annotation: This study examines the clinical progression of acute intestinal infections (AII) in children aged 6 months to 3 years, who were hospitalized for diarrhea of unclear origin linked to candidiasis infection. The indiscriminate use of broad-spectrum antibiotics is recognized as a factor contributing to the proliferation of Candida spp. The correlation between Candida spp. and severe diarrhea leads to persistent intoxication, intestinal impairment, and an extended recovery duration.

Keywords: acute diarrhea, candida infection, intestinal dysfunction, intestinal microbiocenosis.

Introduction

Acute diarrheal infections in young children exhibit distinct clinical and epidemiological characteristics, including considerable variability in clinical manifestations, a substantial incidence of severe and complicated cases, and a propensity for prolonged duration, complicating the rational treatment and rehabilitation of affected children.

These disorders rank second in prevalence, following acute respiratory viral infections. In recent years, the etiological composition of AII has undergone substantial alteration, impacting its clinical and epidemiological characteristics. Currently, there are challenges in elucidating the genesis of acute diarrheal illnesses, the clinical progression of the illness, and treatment options. The frequency of AII in the republic has markedly diminished due to the execution of extensive preventive measures. In recent years, the initiative to address diarrheal diseases is being integrated into routine medical practice, facilitated by extensive organizational and medical interventions as well as scientific research. The study of acute intestinal infections highlights the critical importance of prompt identification and treatment, as diarrheal syndrome, particularly in young children, can result in complications that contribute to negative outcomes. The WHO identifies priority research areas encompassing the origin, pathophysiology, clinical presentation, therapy, and prevention of these disorders, alongside the immune system and the natural microbiota of the large intestine.

Candida fungus are prevalent in the normal microflora and are classified as opportunistic pathogens. The onset of the disease necessitates the establishment of conditions that disturb the regulatory processes governing the typical symbiotic relationships between macroorganisms and microorganisms. The examination of the etiological aspects of diarrheal disorders and their clinical presentations in children constitutes a medico-social issue, underscoring its significance.

Objective: To study the influence of candidiasis infection on the course of acute intestinal infections in young children.

Materials and Methods

Clinical and bacteriological investigations were performed on 35 children aged 6 months to 3 years who received treatment in a hospital for diarrhea of indeterminate cause.

The allocation of patients under inpatient surveillance was conducted in two groups: the primary group consisting of 16 patients with diarrheal disorders associated with candidiasis (Candida albicans), and the control group including 19 patients with diarrheal diseases absent of candidiasis infection. Salmonellosis was identified in 7 individuals, shigellosis in 8, and a diagnosis of severe diarrhea of unclear cause was made in 20 patients.

Results and Discussion

The severity of any disease's progression largely hinges on accurate and prompt diagnosis and the commencement of therapy. Considering this, we examined the referral diagnoses associated with the hospitalized children receiving inpatient care. Among the admitted children, 5 (14.28%) were diagnosed with salmonellosis, while 30 (85.71%) were diagnosed with acute gastroenteritis, gastroenterocolitis, enterocolitis, and AII upon referral.

Identified predisposing factors for candidiasis included: a history of candidiasis in parents in 11 children (31.43%); acute respiratory viral infections accompanied by antibiotic use in 16 children (45.71%); factors that diminish the newborn's immunological reactivity, such as nutritional deficiencies during pregnancy in 2 children (5.71%) and complicated pregnancies in 8 children (22.86%); and factors elevating the risk of bacterial infection during childbirth, including maternal bacterial infections in 9 children (25.71%) and the administration of various antibiotic groups. We found the subsequent variations of diarrheal infections in the context of candidiasis: gastroenteritis in 8 (22.86%), enteritis in 2 (5.7%), enterocolitis in 9 (25.7%), and gastroenterocolitis in 16 (45.71%). Simultaneously, all patients were diagnosed with concomitant lesions affecting various regions of the gastrointestinal tract. No instances of isolated gastritis or colitis were observed.

The quantitative assessment of isolated fungus offers a more precise comprehension of the extent of fungal contamination in the substrate. The level of contamination in the majority of individuals with acute diarrhea was 10^3 to 10^5 bacteria cells per gram of feces. Monitoring patients every five days revealed that the frequency of fungal isolation and the extent of fecal contamination were virtually constant throughout the course of the illness. Upon hospital admission, fungi were frequently isolated prior to the commencement of treatment, occurring in 28.57% of pharyngeal samples and 38.66% of stool samples. During the study of isolated fungus, it was shown that high fungal contamination of feces (exceeding 10,000 cells per gram) was present in only 8.4% of patients before admission, however post-treatment and at discharge, the prevalence increased considerably to 23.53% and 21%, respectively. A significant level of contamination (50,000—100,000 or more cells per 1 g) was observed before admission in just 3.36% of cases, which increased threefold post-treatment (11.76%). This indicates the proliferation of fungus during the treatment procedure in patients who previously harbored them in the intestines upon hospital admission.

We studied the clinical symptoms of diarrheal infections in children with candidiasis, considering their premorbid conditions and comorbidities. A detrimental premorbid background was observed in the majority of children (prematurity, anemia, protein-energy malnutrition, rickets, early

initiation of artificial feeding, recurrent ARVI, pneumonia). The study's results indicated that the primary concurrent disorders included anemia, intestinal sepsis, focal pneumonia, pathological delivery, acute bronchitis or ARVI during the latter half of pregnancy, and chronic pyelonephritis in the mother.

The severity of diarrheal infections in the context of candidiasis was assessed based on the manifestation of intoxication symptoms (fever, vomiting, regurgitation, restlessness, occasional seizures, lethargy, sluggishness, diminished or absent appetite, stunted growth, and weight loss), alongside the extent of intestinal damage. A persistent sign of the condition was fever, predominantly observed in severe and moderate cases. Fifty percent of the patients had an elevation in body temperature, with nine individuals exceeding 39 °C, persisting for two weeks. Gastrointestinal dysfunction was marked by the presence of loose stools, with mucus observed in the feces; in 30% of instances, there was also an admixture of blood and greenness. The study's results indicated a distinct correlation between the frequency of clinical signs of the disease and the severity of its progression. The predominant sign of the condition was frequent bowel movements. The findings of our research indicated that all individuals had frequent stools, irrespective of the disease's severity. The frequency of defecation correlated directly with the severity of the disease: in moderate cases, it typically ranged from 5 to 12 times daily, and in severe cases, it ranged from 10 to 20 times daily. The identification of leukocytes was the most characteristic feature of coprocytography. Erythrocytes in the field are few, numbering 5-10 per field of view. The presence of undigested muscle and plant fibers, neutral fat, and starch grains in the stool indicated poor intestinal function.

Alterations in the gastrointestinal system endured for an extended period, exceeding 2-3 weeks, with the longest length observed in children exhibiting a severe form of the condition. Abdominal tenderness in young kids was indicated by signs of anxiousness, grimacing, and heightened weeping. Intestinal dysfunction persisted despite treatment. All children had bowel rumbling. Fifteen children (42.86%) exhibited hepatomegaly, while twelve (34.28%) presented with splenomegaly. Nine children (25.71%) with a severe form of the disease developed intestinal toxicosis, with six (17.14%) experiencing a severe salt-deficient variant, characterized by lethargy, adynamia, pronounced hypotension, pallor, compromised peripheral circulation, and intestinal paresis. In the remaining 20 children, constituting 57.14%, intestinal toxicosis manifested in the isotonic form. The clinic of toxicosis was predominantly established by the existence and intensity of neurotoxicosis. This condition was observed in nearly all children with intoxication. Nevertheless, the manifestations of general drunkenness were more evident in young infants. Furthermore, alterations in the cardiovascular system, exemplified by diminished heart sounds and tachycardia, were typical of these patients.

The frequency and severity of all symptoms were more pronounced in young children than in later age groups.

Nausea in young children is characterized by a compulsion to vomit and regurgitation, particularly evident in severe cases of the illness. A comparable pattern was observed for vomiting and several signs of the condition. The majority of youngsters exhibited reduced appetite, with some even developing anorexia.

Alterations in peripheral blood correlated with the onset of anemia, predominantly noted in infants during their first year of life - 16 (45.7%). The majority of anemia episodes arise with moderate to severe diarrheal illnesses accompanied by candidiasis. Moreover, notable alterations in the peripheral blood included the emergence of neutrophilia, leukopenia, lymphopenia, and, in certain instances, lymphocytosis.

The dynamics of fungal excretion in relation to etiotropic medication were examined in two patient groups: the first group received antibiotics in conjunction with fluconazole, while the second group received only antibiotics.

Quantitative results indicate that elevated fecal contamination with fungi (10,000 cells per gram) during treatment escalated in all three groups, with the least rise observed in the first group and the most significant increase in the second group. Post-treatment, high fecal contamination in the latter group was seen 12 times more frequently than pre-treatment. As a result, in patients within this cohort, Candida fungus proliferated in the intestines throughout treatment. Upon patient admission to the hospital, fecal contamination with fungi at levels of 100-10,000 cells per gram was observed more frequently than high contamination levels beyond 10,000 cells per gram, occurring at rates of 26.3-38.7%. Throughout the treatment, it exhibited minimal change, correlating with the rise in the high level of contamination. Nonetheless, extremely high contamination levels (50,000-100,000 cells per gram or more) in patients from the second group, which were not recorded at admission, were observed in 16.13% post-treatment. As a result, the most pronounced proliferation of fungus was observed in the intestines of individuals solely administered antibiotics.

A correlation exists between the severity of acute diarrhea and the extent of fungal contamination in feces and other biosubstrates among youngsters. In candidiasis and fungal proliferation, particularly within the gastrointestinal tract, the efficacy of antibacterial treatment diminishes, exacerbating the clinical progression of acute diarrhea: toxicosis, dehydration, and fever become more pronounced, the colitic syndrome is prolonged, and the frequency of exacerbations escalates. Fungi contribute to the occurrence of relapses and exacerbations; therefore, incorporating fluconazole into the comprehensive treatment of acute diarrhea is recommended to prevent them.

Conclusion

Consequently, an exacerbating factor for the proliferation of fungus belonging to the genus Candida is frequently the indiscriminate use of broad-spectrum antibiotics. The presence of Candida fungus with severe diarrhea prolongs intoxication, disrupts intestinal function, and extends recovery time. The administration of antifungal medications to patients inhibits fungal proliferation and diminishes the extent of their contamination in feces and the pharyngeal mucosa.

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