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To Define the Features of the Course of Secretory Diarrhea in Children And Evaluate the Efficiency of Combined Treatment

Tillakobilov Ismoil Baxodirovich
Samarkand State University Department of Skin and Venereal Diseases Samarkand, Uzbekistan

Annotation: *This article provides information about the study of 56 children aged 12 to 36 months. In the complex therapy of patients, the combined preparation "BioGaia ORS" (oral salt solutions in combination with L. Reuteri Protectis DSM 17938 and zinc salts) BioGaia "BioGaia AB", Sweden) was used in doses according to the instructions for use. Criteria for inclusion in the study: children aged 1 to 3 years, the presence of watery diarrhea with dehydration of I-IIA degrees. The aim of our work was to determine the characteristics of the course of secretory diarrhea in children and evaluate the effectiveness of the combined product "Biogaya ORS". To study the etiology, clinical and laboratory characteristics of watery diarrhea in children using combination therapy containing ORS, lactobacilli and zinc.*

Keywords: *secretory diarrhea, treatments.*

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Relevance. Diarrhea (ancient Greek διά-ρροια diarrhea from other Greek δια-ρρέω to flow through or through, to flow), the most common name for diarrhea is a pathological condition in which the patient has frequent (more than 2 times a day) defecation, with In this case, the stool becomes watery, has a volume of more than 200 ml and is often accompanied by pain in the navel, urgency and anal incontinence. In third world countries, diarrhea is a common cause of infant mortality: in 2009, more than 1.5 million children (under 5 years of age) died as a result of this pathological condition. Diarrhea is one of the ten leading causes of death. Distinguish between acute and chronic diarrhea. Acute diarrhea lasts up to two weeks, after which it can be classified as prolonged and then chronic. About 1.7 billion people a year suffer from acute diarrhea of various origins [6]. Chronic diarrhea, according to various estimates, occurs in 7-14% of the adult population of the Earth.

Purpose: to determine the features of the course of secretory diarrhea in children and to evaluate the effectiveness of the combined product "Biogaya ORS". To study the etiology, clinical and laboratory characteristics of watery diarrhea in children using combination therapy containing ORS, lactobacilli and zinc. Assess zinc levels in children before and after combination therapy.

Material and methods. The study included 56 children aged 12 to 36 months. In the complex therapy of patients, the combined preparation "BioGaia ORS" (oral salt solutions in combination with L. Reuteri Protectis DSM 17938 and zinc salts) BioGaia "BioGaia AB", Sweden) was used in doses according to the instructions for use. Criteria for inclusion in the study: children aged 1 to 3 years, the presence of watery diarrhea with dehydration of I-IIA degrees. Criteria for exclusion from the study: invasive type of diarrhea, diabetes mellitus, atopic dermatitis; children vaccinated against rotavirus infection; children younger than 1 year and older than 3 years were not included in the

study; with dehydration IIB-III degree. All studies and taking "BioGay ORS" were carried out with the informed written consent of the child's parents. At admission, clinical symptoms were assessed (frequency and nature of stools, degree of dehydration and its duration, frequency and nature of vomiting, duration of diarrhea and vomiting) and laboratory parameters: complete blood count, complete urinalysis, biochemical blood test: levels of urea, creatinine, potassium, sodium, chloride, zinc. Confirmation of the etiology of AII was carried out using bacteriological, immunohistochemical and molecular biological methods for examining feces. Recording of clinical symptoms was carried out daily, control of laboratory parameters was carried out after 4-5 days. The study of the level of zinc in blood serum was carried out using the Zinc-Vital test system (Vital Development Corporation, St. Petersburg, Russia) by the colorimetric method without deproteinization. In accordance with this test system, the normal values of zinc in the blood serum in children from 1 to 5 years old are 10-18 μmol/l (without gender differences). Statistical processing of the data obtained as a result of the research was carried out by traditional methods of variation statistics using the Statsoft Statistika 6.0 program.

Results and its discussion. The children were admitted to the hospital with complaints of vomiting, loose stools, fever up to febrile levels (average 38.3°C). The duration of fever in the examined children averaged 2.2±1.1 days. The design of the study included two groups of patients: group 1 (n=26), in which children received basic therapy (low-lactose diet, enterosorbents) and "BioGaya ORS" at an age dosage, and group 2 (n=30), whose children received basic therapy and standard ARS. The groups were comparable in terms of age, sex and disease severity. Vomiting in patients of group 1 was observed with a frequency of 2-4 times a day, with a maximum of up to 10 times a day, its duration was from 1 to 3 days. Moreover, the frequency and duration of vomiting did not depend on the age of the patients. All observed children had watery diarrhea with a frequency of 3 to 12 times a day. The mean duration of diarrhea was 2.5±1.3 days. Dehydration degree I was detected in 24 (92%) patients, degree IIA in 2 (8%) patients, which made it possible to carry out rehydration therapy by the oral method. The content of zinc in blood serum in children of the 1st group before treatment was 11.43 (10.02-12.04) mmol/l, which was closer to the lower limit of the age norm. After treatment, the level of zinc in the blood serum was significantly higher ($p<0.001$) and amounted to 14.43 (12.44-16.2) mmol/l. Clinical manifestations of acute intestinal infections in children of group 2 at the onset of the disease did not differ from those in patients of group 1. Vomiting in these patients was observed with a frequency of 3-4 times a day, with a maximum of up to 9 times a day. Its duration was from 1 to 2 days. All observed children had watery diarrhea with a frequency of stools from 6 to 12 times a day. The mean duration of diarrhea was 3.1±1.5 days. Dehydration degree I was detected in 23 (77%) patients, degree IIA in 7 (23%) patients. The content of zinc in blood serum in children of the 2nd group before treatment was 12.6 (10.3-13.8) mmol/l, which was also closer to the lower limit of the age norm. After treatment, the level of zinc in the blood serum of these children was 14.6 (12.3-16.3) mmol/l, which did not significantly differ from the initial values. However, it should be noted that the level of zinc in the blood serum of the examined children at the time of the disease corresponded to age indicators. At the same time, the use of "BioGay ORS", which includes zinc, made it possible to significantly increase the level of zinc. Biochemical parameters of urea, creatinine and electrolyte composition of the blood in patients of both groups were within the age norm (table 1). All children were diagnosed with isotonic dehydration. General blood counts and leukocyte index of intoxication (according to Kalf-Kalif Ya. Ya., 1941) indicated a mild degree of intoxication syndrome. In the general blood test at admission, leukocytosis was detected in patients of both groups - 11.24 (8-12.6)x109 / l, relative neutrophilia (segmented neutrophils - 51.04 (37-61)%, stab neutrophils - 5.5 (2-8)%). The leukocyte index at the onset of the disease was 1.9 (0.64-2.03). After recovery, the level of leukocytes in children of both groups was 8.06 (6.22-8.97)x109/l, which was significantly lower ($p=0.013$) than at the beginning of the disease. In the leukocyte formula, there was a decrease in the number of

segmented neutrophils to 36.05 (25.5-48.5)% with a significance of p=0.011. The leukocyte index after treatment significantly (p=0.013) decreased to 0.77 (0.4-1.2). 90% of children used BioGaia ORS willingly, in combination with other types of drink. Side effects (vomiting immediately after ingestion, rash, allergies) to the drug were not detected. The difference between "BioGay ORS" and other oral rehydration agents is not only the inclusion of probiotic and zinc salts, but also a lower osmolarity of the solution, which plays a significant role in watery diarrhea. The main etiological cause of diarrhea was viruses (76.8% of all cases), including: 61.5% - rotaviruses, 11.5% - adenoviruses, 3.8% - enteroviruses. In 11.5% of cases, diarrhea was caused by a mixed infection (bacteria of the genus Campylobacter + adenoviruses, adenoviruses + noroviruses). In 11.7% of cases, the etiology of AII could not be established.

Conclusions: Secretory diarrhea in young children is manifested by vomiting, fever and loose stools. In the vast majority of the examined children (76.8%), acute intestinal infections were of a viral nature, mainly of rotavirus etiology. The use of "BioGay ORS" showed a significant increase in the level of zinc (p<0.001) in the blood serum of children with watery diarrhea. The increase in the level of zinc in the blood and the good tolerance of BioGaia ORS, which contains salts for oral rehydration, zinc and lactobacilli, and has a low osmolarity, allows us to recommend it in the treatment regimen for acute intestinal infections in children.

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