ROTEVIRUS INFECTION IN CHILDREN

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Abstract

Rotavirus infection (RVI) considered one of the most common infectious diseases of the gastrointestinal tract in children, is an acute infectious disease with high contagiousness, characterized mainly by damage to the gastrointestinal tract (GIT) in the form of gastroenteritis, accompanied by the development of symptoms of diarrhea, vomiting, dehydration and symptoms of general intoxication, as well as respiratory (catarrhal) syndrome in the initial period of the disease. Rotavirus infection (RVI) is considered one of the most common infectious diseases of the gastrointestinal tract in children. This disease, caused by rotaviruses and having the code A08.0 in the International Statistical Classification of Diseases (ICD-10) ("Rotavirus enteritis"), occurs mainly in children under 5 years of age, which is explained by the fact that their hygiene habits have not yet been formed and they have low immunity. Vomiting, diarrhea and high temperature, the main symptoms of the disease, lead to pathological loss of water and salts from the body in a short time, in other words, to dehydration of the body, which is considered more dangerous, which can lead to the development of various complications and even death. In 45-50% of cases, RVI can be found with other pathogens, such as norovirus, astrovirus, and in rare cases- as a mixed infection (rotavirus + salmonellosis). As mentioned above, rotavirus infection (RVI) remains one of the main causes of gastroenteritis in children under 5 years of age. Thus, more than 100 million acute intestinal infections (AII) associated with RVI are registered annually in the world. Due to the mild form of the disease in most patients and the elimination of symptoms at home, the etiology of the disease sometimes remains unclear. However, despite the latest advances in medicine, 600,000 or more deaths from RVI are registered annually [1,2]. Such a high mortality rate in RVI, especially mixed infections, is due not only to acute dehydration, but also pneumonia, meningitis, myocarditis, etc. This may be associated with extraintestinal complications. [2, 3]. According to some data, up to 10% of examined patients have signs of systemic damage to the pancreas, kidneys, liver, central nervous system, heart, lungs and blood vessels in RVI [1, 2, 5]. It is clear that the frequency of such complications may vary depending on the strain of rotavirus, the characteristics of the immune system and the adequacy of therapy.

Keywords: children, rotavirus infection, mixed infection, hepatomegaly, kidney damage, myocarditis.

Introduction: to study the complications that may arise with rotavirus and combined rotavirus-salmonella infections in children.

Material and methods. The study involved 52 children aged 1 month to 10 years. The examination assessed the frequency and nature of complications, mainly in the abdominal cavity and urinary system, in 32 patients with rotavirus infection and 20 patients with combined rotavirus-salmonella infection. Etiological diagnosis of the disease was performed using enzyme immunoassay (EI) and polymerase chain reaction (PCR). The majority of patients, 65% (34 children), were children under 1 year of age. Moderate RVI was detected in 42 patients (80.8%), and severe RVI in 2 patients (3.8%).The disease itself in 31 (59.6%) patients was gastroenteritis; 24 (46.2%) children had grade I-II ecchymosis; In 2 (3.9%) patients, the main symptoms were grade III ecchymosis. In addition to clinical observations, all patients underwent general blood and urine tests, ultrasound and ECG, as well as additional laboratory tests to clarify the nature of complications. Thus, in addition to determining the level of activity of liver enzymes, such as alanine transferase (ALT) and aspartate transferase (AST), ultrasound can be used to assess the functional state of the liver, spleen, pancreas and bile ducts, as well as kidneys and urinary tract, and the echographic characteristics of the parenchyma were assessed. During examination of the cardiovascular system, symptoms of myocardial damage were recorded in 12 (23.1%) patients. All patients with rotavirus infection were prescribed basic therapy according to the rules of the modern protocol [12,13]. Statistical processing of the obtained results was carried out and differences expressed by $p<0.05$ were considered significant.

Results. During our examination, the majority of patients with RVI revealed an increase in the echographic sizes of the liver and spleen, as well as mild reactive changes in the parenchyma. It was found that hepatosplenomegaly was observed more often than hepatosplenomegaly in RVI (12 (37.5%) versus 18 (56.3%), respectively), the leading organs of the hepatobiliary system in combined rotavirus-salmonella infection 13 (65%) patients with echographic damage are characterized by hepatosplenomegaly $p <0.01$. In patients with both RVI and its combined forms, there are clear signs of damage to the pancreas and bile ducts (an increase in the echographic sizes of the pancreas and bile in the gallbladder compared to that). stasis), various bends/deformations of the gallbladder are recorded.If in the majority of patients (34.4%) the echographic signs of kidney damage against the background of RVI were accompanied by such changes as moderate thickening of the vascular wall (clearly noticeable in 2.1±3.1% of patients), then the laboratory signs of acute

renal failure were only severe form was registered in 1 (1.9%) patient under 1 year of age, who had progressive RVI. The frequency of kidney damage in combined rotavirus-salmonella infection does not exceed 6.2±3.7%. The echographic signs of damage to the urinary system are limited to minimal changes. In these patients, iron deficiency anemia was determined in 6 (18.8%) patients. As a possible option, it was estimated that pneumonia registered in 3 (9.4%) patients was associated with other infectious agents, since it developed before RVI infection. Meningeal and focal neurological symptoms were not registered in any of the examined children with RVI. Among the clinical symptoms from the cardiovascular system against the background of RVI, systolic murmur was detected for the first time in 12 (31.2%) patients, muffled heart sounds in 3 (9.4%) patients, tachycardia of the heart rhythm in 2 (6.3%) patients. Bradycardia-type disorders were recorded. Changes detected in the ECG and ExoQG were regarded as deviations corresponding to possible infectious myocarditis. Biochemical blood tests revealed high activity of liver enzymes (ALT, AST), as well as the De Ritis coefficient (AST/ALT). in relation to the comparison group (p=0.0001). Although such a high frequency of complications from the hepatobiliary and urinary systems in RVI is probably associated with the characteristics of the rotavirus strains circulating in the blood, the immune response to other concomitant diseases modulated by previous therapy, as well as genetic factors, ecology, and maternal health. it is expected that his condition and bad habits are of no less importance in this matter.

Conclusion. The examination revealed mild hepatomegaly in about half of the patients and reactive kidney changes in about 1/3 of patients with RVI. Combined rotavirus-salmonella infection in most patients is accompanied by hepatosplenomegaly and damage to the organs of the hepatobiliary zone. During our study, pneumonia was diagnosed in 9.4% of patients with RVI, iron deficiency anemia - in 18.8%. Clinical, laboratory and echocardiographic signs of myocardial damage corresponding to acute infectious myocarditis are found in almost all patients with severe RVI.

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