



Clinical and Epidemiological Characteristics of Rotavirus and Norovirus Infection in Children in Andijan Region

1. Oripova Jamila Nematovna

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¹ Department of Infectious Diseases,
Andijan State Medical Institute
The Republic of Uzbekistan

Abstract: This group of diseases are symptoms of intoxication and gastroenteritis or enteritis is defined by Doctors of such diseases in the 20s of our century began to attract attention, "epidemic diarrhea", "cholera-like disease" terms like Finally, these diseases are caused by viruses 50 became known in the years and began to be called enteroviruses. According to the World Health Organization, kura weighs heavily on earth 20-40% of diarrheal diseases are caused by viruses. Every year, 1-2 mln a person dies. Currently, there are several types of this type of virus: rotoviruses, enteroviruses (Coxsackie and ESNO) and coronaviruses. Viral intestinal infections play an important role in infectious morbidity in children of different ages.

Key words: intestinal infections, children, viral diarrhea, PCR.

INTRODUCTION

The relevance of the problem of acute intestinal infections (AI) is due to the fact that this group of infectious diseases consistently retains one of the leading places in the structure of childhood morbidity and mortality. Every year, OCIs cause the death of more than 1 million children worldwide. Mortality is especially high in children in the first years of life.

In our country, more than 0.7 million cases of acute intestinal infections per year are officially registered, of which about 60% are due to viral diarrhea [2].

Currently, rotaviruses are considered as the main etiological factor of ACI, especially in children under 5 years of age. According to the World Health Organization (WHO), about 138 million cases of rotavirus infection are registered annually worldwide [3].

In the US and other developed countries, according to U.D. Parashar, J.S. Bresee, before the introduction of specific prophylaxis, approximately 2.3 million children under 5 years of age were infected with rotavirus each year, resulting in an economic cost of more than \$275 million per 500,000 physician consultations and 50,000 hospitalizations [3].

The damage from rotavirus infection is incomparably higher in the developing countries of South Asia, India, and Latin America, where from 20 to 70% of hospitalizations are associated with this etiological agent. Mortality from rotavirus infection ranges from 454 to 705 thousand cases per year and averages 611 thousand cases [4]

At the same time, in developed countries of Europe, countries of South America, and Australia, mortality from rotavirus infection has sharply decreased in recent years, which is associated with the introduction of vaccination [4].

It is believed that rotaviruses infect almost every child before they reach the age of 3–5 years [5]. In developing countries, the average age of initial rotavirus infection ranges from 6 to 9 months (80% of cases occur in children under 1 year of age), while in developed countries the first episode of infection may appear between 2 and 5 years of age, although most cases still occur observed among infants (65% of cases are registered in children under 1 year of age) [5]. The decrease in the incidence of rotavirus infection in developed countries is associated with the mass introduction of vaccination since February 2006. In Russia, the RotaTeq vaccine (pentavalent reassortant rotavirus vaccine, MSD Pharmaceuticals, a division of Merck, USA) was registered in Russia in 2012, but no results have yet been achieved. objective results due to the small number of vaccinated children.

At the same time, after the introduction of routine vaccination against rotavirus gastroenteritis, norovirus infection became the cause of more than 50% of cases among AE outbreaks recorded in the United States according to data for 2013 [6, 7]. In Russia, norovirus infection ranks second in frequency of detection among deciphered viral agents (32%) [8]. According to domestic researchers published in recent years, in the structure of acute intestinal infections in children in St. Petersburg, Novosibirsk, Arkhangelsk, noroviruses of the first and second genotypes total 11.1%, 13.5% and 26.5% of cases, respectively, with a predominance of noroviruses of the second genotype [9].

With the expansion of diagnostic capabilities, the decoding of other viral intestinal infections has also increased.

According to most literature sources, adenoviruses of serogroup F (the so-called “intestinal” adenoviruses) are the third most important etiological agent of viral acute intestinal infections. Adenovirus affects all age groups, has no distinct seasonality, and is characterized by contact route of infection. There are often reports of outbreaks of adenovirus infection. Adenovirus species D, in particular HAdV-67, was isolated from feces during a large outbreak of acute respiratory infections in Bangladesh, and in India, circulation of adenovirus serogroup F was observed in children with acute diarrhea in the age group under 5 years [10–11].

In the world literature, a relatively small number of publications are devoted to astrovirus infection. The study of the role of astroviruses in the development of acute non-bacterial gastroenteritis began in

1975, when, using electron microscopy, they were first discovered in the feces of children with diarrhea. When studying the prevalence of astrovirus infection among children, it was possible to establish that up to 71-75% of children aged 3 to 10 years have antibodies to astroviruses, although they had no history of signs of the disease. It is known that astroviral gastroenteritis often occurs in a mild form. Virus-neutralizing antibodies to serotype 1 were detected in 92% of cases, serotype 3 in 69%, serotype 4 in 50%, serotype 5 in 36% and serotype 2 in 31% of the examined children. Outbreaks of diarrhea associated with astroviruses occur in preschool institutions, schools, and nursing homes. Most often, outbreaks of astrovirus infections are caused by the first serotype of the virus. Interesting data were obtained from a study in which 17 adults took part. It was found that astroviruses have low pathogenicity because, despite infection, clinical signs of disease

PURPOSE OF THE STUDY: to study the etiological structure and features of the course of viral diarrhea in hospitalized children in 2019 - 2023.

MATERIALS AND METHODS

Under observation in 2019 - 2023. There were 5528 children hospitalized in the clinic of intestinal infections of the regional infectious diseases hospital in Andijan, of which 3340 (59.8%) had verified Acute intestinal infections, 2600 (45.2%) - with confirmed viral Acute intestinal infections. The proportion of diarrhea of viral origin among the deciphered acute intestinal infections was 67.%.

The assessment of the clinical course of infectious diarrhea was carried out in accordance with the principle of determining the type, severity, and nature of the course of the infectious process [7]. When assessing the severity of the disease, the severity of symptoms of intoxication, temperature reaction and local gastrointestinal syndrome were taken into account. Particular attention was paid to the course of the infectious process, namely the unsmooth nature of the course: the presence of complications, exacerbations or relapses. An assessment was made of dehydration syndrome and forms of severity in 977 examined children with viral diarrhea of various etiologies.

All patients underwent a standard laboratory examination, which included: clinical blood tests, urine tests, biochemical blood tests, coprocytogram; The etiological interpretation of the diagnosis included, in addition to the microbiological method, bacteriological seeding of feces on solid nutrient media to isolate a pure culture of the pathogen, PCR of feces for bacterial and viral agents (detection of RNA/DNA of pathogens). Samples were collected in accordance with the methodological instructions MU 1.3.1794-03 "Organization of work during PCR studies of material infected with microorganisms of pathogenicity groups I-II."

For statistical analysis, the statistical package STATSOFT 6.0 was used in the work; differences were considered significant at $p < 0.05$.

RESULTS AND DISCUSSION

During the study, we were able to identify the following features of viral diarrhea in children.

According to the regional infectious diseases hospital in Andijan, in 2016 - 2017. When using routine methods of verification of infectious diarrhea (microbiological method and fecal ELISA), the frequency of deciphered intestinal infections was 48%, of which 12.5% were salmonellosis, 10.3% were campylobacteriosis, 7% each were shigellosis and Acute intestinal infections. opportunistic etiology, 3.5% - for yersinia infection, 5.4% - for escherichiosis and 52.3% - for viral gastroenteritis [1].

We compared the etiological structure of viral diarrhea in different periods. Submitted by the Department of Intestinal Infections, in 2016 - 2017. the share of rotavirus infection was 56% and occupied a dominant position in the etiological structure of viral acute intestinal infections, 25% was allocated to calicivirus gastroenteritis.

It was found that from the end of 2019 to 2023, according to a molecular genetic study, rotavirus (40.44%) and norovirus infections (21.18%) predominated among the deciphered diarrhea, the percentage of mixed viral-bacterial Acute intestinal infections was 7.2%, and viral viruses - 8.46%. Table 1 shows the dynamics of the frequency of detection of both mono-infections and mixed viral-viral diarrhea.

The incidence of rotavirus infection remained high throughout the study period (44.6 - 58.9%), the frequency of detection of norovirus gastroenteritis increased from 24% in 2020 to 32% in 2022, the proportion of viral-virus associations increased from 8.4% in 2020 to 14.4% in 2022

Analysis of deciphered viral diarrhea by season revealed that in the autumn-winter period rotavirus infection dominates up to $48 \pm 1.6\%$. At the same time, in the winter months of 2021 and 2023, there was a decrease in the incidence of norovirus infection ($7 \pm 2.3\%$), compared to the winter months of 2020 and 2022, when its share was $35 \pm 1.4\%$. At the same time, in 2020 and 2022. an increase in the number of viral acute intestinal infections was detected up to $9 \pm 2.1\%$ and $15 \pm 1.6\%$, respectively, and including astroviral gastroenteritis up to $5.6 \pm 0.8\%$ and $3.5 \pm 0.5\%$, respectively.

We noted that during 2021 and 2022, increases in the incidence of astrovirus infection were recorded (2021 June - 4.94%, November - 2.11%; 2022 July - 2.38%, November - 3.10%, December - 2.34%), which is quite consistent with the data of foreign authors.

CONCLUSION

Thus, it was found that using the polymerase chain reaction method, the frequency of etiological decoding of acute intestinal infections increases (from 48% in 2009 to 60% in 2013).

The predominance of diarrhea of viral origin among the deciphered Acute intestinal infections is shown - 77.35%. A high proportion of rotavirus infection in the overall structure of viral diarrhea was revealed - up to $48 \pm 1.6\%$, the proportion of other viral etiological agents was established - astrovirus up to $2.1 \pm 0.4\%$, adenovirus - $5.5 \pm 0.8\%$, enterovirus — $2.2 \pm 0.3\%$ in the morbidity structure.

Age-related features of viral mono-infections and mixed viral gastroenteritis have been established: up to 45.3% occur in children under 3 years of age, the second most frequently detected group is the group of children from 3 to 6 years old - 20.4%. In children over 6 years of age, the share of norovirus infection was 45.2%, virus-virus associations were more often detected in children of the first year of life - 13.1%. It has been proven that the frequency of development and degree of dehydration depends on the etiological agent; with rotavirus infection and mixed viral diarrhea, up to 60% of cases occur with the development of grade 1-2 dehydration.

It was revealed that the most often severe forms of viral gastroenteritis also develop with rotavirus infection (14%) and virus-virus associations (12%).

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