

# Viral gastroenteritis

Viral gastroenteritis is an inflammatory infectious disease of the gastrointestinal tract caused by a viral agent - most often rotaviruses and noroviruses. These infections are most dangerous, especially in young children under 5 years of age, because they are more prone to develop severe dehydration, which can lead to life-threatening conditions. However, viral gastroenteritis does not only endanger children, it occurs at any age and can spread very quickly, especially in groups. The group of these diseases has a very high incidence, in the Czech Republic we have about 6 to 10 thousand cases of viral gastroenteritis per year and it is assumed that the statistical data are significantly underestimated, because most patients with diarrheal disease do not even seek medical care.

There is a voluntary vaccination against rotavirus infections for children from 6 weeks to 8 months, it is a live vaccine (Rotarix, Rotateq), which is administered orally in 2, resp. 3 doses. Rotavirus vaccination is not intended for use in adults.

## Symptomatology

The main manifestation of viral gastroenteritis is diarrhea, which may be accompanied by fever, nausea, vomiting and non-specific abdominal pain. Diarrhea is, according to the WHO definition, a condition characterized by two or more loose stools a day, or even a single loose stool that contains mucus, blood or pus. The key to diarrhea is sudden development and a maximum duration of fourteen days.

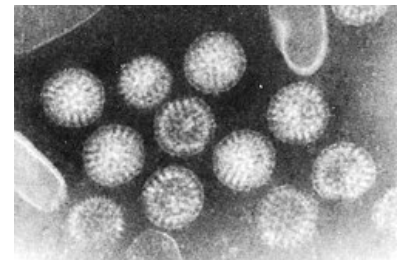
Complicated diarrhea with insufficient symptomatological therapy (ie insufficiently compensated fluid and electrolyte loss) leads to dehydration and, in extreme cases, to metabolic breakdown and subsequent renal failure with appropriate symptomatology.

## Etiological agents

In our country, the most common viral agents causing gastroenteritis are rotaviruses, noroviruses, adenoviruses, astroviruses and sometimes also coronaviruses. The individual groups differ both in the average age at which patients are affected and in the different seasonal incidence.

### Diarrhea caused by rotaviruses

Diseases that mainly affect **younger children (3-5 years)**, however, anyone of any age can be infected. In children under 5 years of age, they are the most common agents causing acute diarrheal disease worldwide. In the first two months of life, newborns are rarely infected because they are protected by maternal immunoglobulins, but the effect of breastfeeding has not been elucidated. They can be fatal, so it is recommended to use an **oral vaccine** as a prevention in infants. It is still a common cause of infant death in developing countries.



Rotavirus

Occurrence is both sporadic and epidemic (for example, in crèches or in children's wards in a hospital as a nosocomial pathogen). Most typically in spring and winter ("winter disease"). Transmission occurs via the fecal-oral route, in the first 7-10 days it is excreted in the faeces. In case of insufficient personal hygiene, the disease can spread very quickly, because the transfer of 10 rotavirus particles is enough to manifest the disease. The incubation period is very short, 1-3 days.

### Clinical picture

It often begins atypically, eg as catarrh of the upper respiratory tract, followed by vomiting, high fever and diarrhea, as well as anorexia or flatulence. Stools are frequent, watery, without mucus and blood, usually lasting 4-5 days. Dehydration occurs rapidly, which is more severe than in gastroenteritis of bacterial origin. The virus is sensitive to pH less than 2 and the affected person is lactase deficient (after 10-14 days).

### Diagnostics

- History, epidemiological situation,
- rapid detection of rotaviruses or their antigens in native faeces by immunochromatographic or latex agglutination method, ev. ELISA,
- less available methods: direct electron microscopy (high sensitivity), PCR, culture (difficult).

### Diarrhea caused by Norwalk viruses and noroviruses

The name is derived from the city of Norwalk in the USA, where the virus was first detected from the stools of high school students. Norwalk viruses and noroviruses belong to the family Caliciviridae. It occurs in both school children and adults, with an increased incidence in winter. The source is humans or contaminated food (often raw seafood, strawberries and raspberries), transmitted by the fecal-oral route. The virus is excreted in the faeces for about the first 4 days, the infectious dose is very small.

## Clinical picture

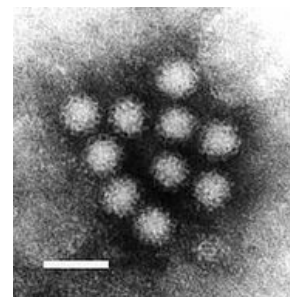
The incubation period of the disease is 24–48 h, then it manifests itself in sudden abdominal pain, loss of appetite and vomiting (2–3 days). Diarrhea affects only 30–40% of those infected, the course is benign, sometimes only vomiting ("winter vomiting"), sometimes only with diarrhea, or both. Diarrhea is watery, without impurities. Temperature may not accompany the disease. The disease is very rapid, diarrhea ceases within 48 hours and hospitalization is rarely necessary.

## Diagnostics

For diagnosis we use information about the current epidemiological situation, the detection of antigen in the stool.

## Diarrhea induced by enteradenoviruses 40 and 41 and astroviruses

Children with adults can be affected, the manifestation is watery diarrhea with fever. The course is easier than with rotavirus infections. In the Czech Republic, the incidence is relatively low, most often in children under 2 years of age.



Norwalk virus

## Coronavirus-induced diarrhea

Coronaviruses mainly cause respiratory tract infections, gastroenteritis and specific so-called enteric coronaviruses. Occurrence is recorded mainly in children 2–12 years. There may be blood in the stool.

**Diagnostics:** verification only by electron microscopy.

## Therapy

Therapy does not differ according to the etiological agent, it is the same for all viral gastroenteritis, there is no specific treatment, so we use only **symptomatological treatment** of dehydration caused by fluid and electrolyte loss, diarrhea and vomiting. We **rehydrate** the patient in a timely and appropriate manner, monitor and, if necessary, correct the metabolism of minerals (mainly Na and K) as well as possible acidosis. We try to rehydrate orally, if this is not possible or the patient vomits, so we approach intravenous rehydration.

We also do not unnecessarily delay the gradual **realimentation** of the patient. Suitable foods include, for example, bananas, apples, rusks, mashed potatoes, rice soups, lean meats, chicken broth. Conversely, patients should avoid fatty, fried and spicy foods, alcohol, chocolate and bloated vegetables for several days after the infection has subsided. Following rotavirus infections, a lactose-free diet is appropriate, and low-lactose milk in infants.

Antibiotics are completely ineffective in the treatment, on the contrary, they can worsen the disease and prolong its duration, due to damage to the natural intestinal microflora.

The administration of lactobacilli, zinc or adsorbents (Calcium carbonicum, Smecta, ...) could have a certain effect on shortening the disease. In case of high fevers, we can give antipyretics.

## Prognosis and prevention

Even today, viral gastroenteritis can be fatal, especially in the aforementioned young children and the elderly. The best prevention in children is the **oral vaccine**, which protects them from infection, as well as **strict hygiene measures** in case of disease. It is also important to consider the excretion of the virus in the faeces a few days after the symptoms of the infection have subsided. Vaccination can start at 6 weeks of age and should be completed by 24–32. weeks of life. In our country, vaccination against rotavirus is not part of the mandatory vaccination calendar, so it is up to parents whether to have their child vaccinated. Older children, adults and the elderly cannot be vaccinated.

In general, the prognosis of the disease is **good** in European healthcare conditions. However, high mortality from viral gastroenteritis, or acute diarrheal diseases in general, remains a problem in developing countries, where 5–10 million people die of acute diarrhea each year, of which about 2 million are children.

## Links

### Literature used

- TÁBORSKÁ, Jana. *Interní medicína pro praxi : Virové gastroenteritidy, léčba* [online]. ©2013. Poslední revize 2013, [cit. 2015-12-08]. <<http://www.internimedicina.cz/pdfs/int/2013/01/03.pdf>>.
- BENEŠ, Jiří. *Studijní materiály* [online]. [cit. 2010]. <<http://jirben.wz.cz>>.
- HRODEK, Otto a Jan VAVŘINEC, et al. *Pediatric*. 1. vydání. Praha : Galén, 2002. ISBN 80-7262-178-5.
- ŠAŠINKA, Miroslav, Tibor ŠAGÁT a László KOVÁCS, et al. *Pediatric*. 2. vydání. Bratislava : Herba, 2007. ISBN 978-80-89171-49-1.
- ASTER, Viktor. *Střevní infekce* [online]. III. klinika infekčních a tropických nemocí FN Na Bulovce a 1.LF UK, ©2005. Poslední revize 12.10.2005, [cit. 2015-12-08]. <<http://www1.lf1.cuni.cz/~hroz/enterva1.htm>>.

