Caliciviruses

Small viruses, members of the family Caliciviridae are important agents of viral gastroenteritis in humans. These are naked viruses with an icosahedral capsid. They have single-stranded, linear RNA.

The family contains the main human pathogen **noroviruses**.

Important Properties of Caliciviruses

Virion: Icosahedral, cup-like depressions on capsid surface.

Genome: Single-stranded RNA (ssRNA), linear.

Envelope: None (naked).

Replication: Cytoplasm.

Outstanding characteristics: Noroviruses are major cause of nonbacterial epidemic gastroenteritis. Human viruses are non-cultivable.

Classification:

The family Caliciviridae is divided into the following genera:

1. ***Norovirus***, which includes the Norwalk viruses.
2. ***Sapovirus***, which includes the Sapporo-like viruses.
3. ***Nebovirus***, which includes bovine enteric viruses.
4. ***Lagovirus,*** the rabbit hemorrhagic disease.

Clinical Findings:

Noroviruses (Norwalk viruses) are the most important cause of epidemic viral gastroenteritis in adults. Epidemic nonbacterial gastroenteritis is characterized by:

1. absence of bacterial pathogens.

2. gastroenteritis with rapid onset and recovery and relatively mild systemic signs.

3. an epidemiologic pattern of a highly communicable disease that spreads rapidly with no particular predilection in terms of age or geography.

4. characteristics of norovirus include a low infectious dose (as few as 10 virus particles).

Various descriptive terms have been used in reports of different outbreaks (e. g., epidemic viral gastroenteritis, viral diarrhea, winter vomiting disease) depending on the predominant clinical feature.

Norwalk viral gastroenteritis has an incubation period of 24–48 hours. The onset is rapid, and the clinical course is brief, lasting 12–60 hours; symptoms include non-bloody diarrhea, nausea, vomiting, low-grade fever, abdominal cramps, headache, and malaise. The illness can be incapacitating during the symptomatic phase, but hospitalization is rarely required.

Dehydration is the most common complication in young and elderly individuals. Viral shedding may persist for as long as 1 month. No sequelae have been reported.

Transmission mode:

1. Fecal-oral route through contaminated food or water.
2. Person to-person transmission via fomites or aerosolization of contaminated body fluids (vomitus, fecal material).
3. Outbreaks in closed settings, such as cruise ships and nursing homes, are typical.

Laboratory diagnosis:

1. PCR is the most widely used technique for detection of human caliciviruses in clinical specimens (feces, vomitus) and environmental samples (contaminated food, water).
2. Electron microscopy is frequently used to detect virus particles in stool samples.
3. ELISA immunoassays.

Treatment and Control:

Treatment is symptomatic. The low infectious dose permits efficient transmission of the virus. Effective **hand washing** is probably the most important method to prevent norovirus infection and transmission. Because of the infectious nature of the stools, care should be taken in their disposal. Containment and disinfection of soiled areas and bedding can help decrease viral spread. Careful

processing of food and education of food handlers are important because many foodborne outbreaks occur. Purification of drinking water and swimming pool water should decrease norovirus outbreaks. There is no vaccine.

Lecturer: Dr. Eiman Ali Saeed

Department of Clinical Laboratory Sciences