

Norovirus

- ▷ Noroviruses cause an infectious disease in all age ranges.
- ▷ Symptoms include severe sickness and diarrhoea.
- ▷ Noroviruses infect 600,000 to 1 million people in the UK every year.
- ▷ They cause 50% of all epidemic gastroenteritis worldwide

What is norovirus?

The name norovirus comes from 'Norwalk virus', which was first described in 1968 in Norwalk, USA. In the UK it used to be called SRSV (small round structured virus). Other names for the infection include: winter vomiting disease, viral gastroenteritis and acute non-bacterial gastroenteritis.

Noroviruses are part of the Calicivirus family. Noroviruses are classified into 5 genogroups (GI, GII, GIII, GIV, GV), which are divided into at least 31 different genotypes. Genogroups I, II and IV infect humans, III infects cattle and V has been found in mice. Genogroup II genotype 4 accounts for the majority of outbreaks in adults, which can be pandemic.

Symptoms

More than 50% of people exposed to norovirus will become ill. It causes acute gastroenteritis, which is inflammation of the stomach and the small and large intestines. Symptoms include: sudden onset of nausea, projectile vomiting, watery diarrhoea and abdominal pain. People may also experience lethargy, weakness, muscle aches, headaches and low-grade fever. Dehydration is a common complication, particularly in the very young, elderly and immunocompromised and this can become life-threatening. Seizures may also occur in rare cases. Children experience more vomiting than adults.

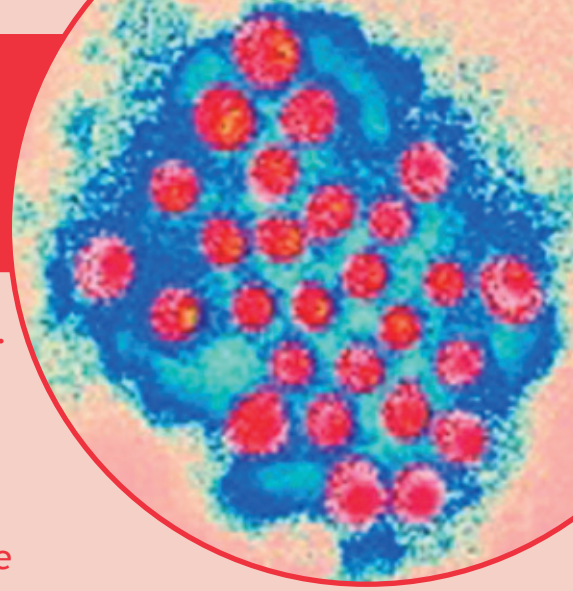
Symptoms develop 24 to 48 hours after exposure to the virus, but can start within 12 hours. Symptoms typically last 12 to 60 hours but diarrhoea may last longer. Most people recover in 1 to 2 days as the illness is self-limiting. Up to 30% of people infected experience no symptoms.

Sources/spread

Norovirus is spread by the faecal-oral route. People become infected by contact with an infected person, touching the mouth after contact with contaminated surfaces or objects, or consumption of contaminated food or water. The virus is not airborne. Food can become contaminated by infected food handlers and it is important that they report the illness to their employer. Shellfish are a common source of norovirus, especially if eaten raw. Shellfish are filter feeders and concentrate noroviruses from faecally contaminated sea water.

Norovirus spreads easily between people. They are contagious from when they feel ill to at least 3 days after symptoms stop. Some people can shed viral particles for up to 2 weeks after recovery, although it is unclear whether they remain infectious for that long. There is a risk of infection from aerosols of projectile vomit and as few as 10 virus particles are sufficient to infect a person. Norovirus can also survive in contaminated areas, including bedding, furnishings and carpets. Environmental contamination is common, especially around toilets.

Areas where large numbers of people congregate for periods of several days provide an ideal setting for a norovirus outbreak. It thrives in semi-closed environments such as hospitals, nursing homes, schools, cruise ships, prisons and military establishments. Seasonal distribution is most marked in these places, with the majority of outbreaks occurring in the winter months. Several modes of transmission can occur in one outbreak, e.g. from food to human, then human to human, then contaminated surface to human.



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The Society for General Microbiology (SGM) Microbiology Awareness Campaign aims to highlight the important issues relating to microbiology. Through its many members, the SGM can offer impartial and expert information on all microbiological topics. Enquiries are welcome.

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Incidence

Only a small fraction of cases are reported, as most people do not visit a doctor. It is estimated that for every case that reaches the diagnostic laboratory there are 1500 cases in the community. This winter (2007) the UK has seen the highest incidence of reported norovirus cases for 5 years, with up to 2.9 million cases between September and December. This may be due to the early onset of the norovirus peak season, raised awareness of the public and doctors, possibly a mutation in the virus coat protein and improvements in diagnosis.

Treatment

There is no specific antiviral drug for norovirus infections. General advice is to let the illness run its course and to treat the symptoms.

Infected people should drink plenty of fluids, juice or water, to avoid dehydration.

Fluid and electrolyte replacement, oral or intravenous, is important in the very young, elderly and immunocompromised. Adults can take proprietary anti-diarrhoea treatments.

Immunity

After exposure to norovirus, immunity is short-lived and genotype-specific, so re-infection is likely due to the genetic variability of the virus. Multiple exposure and infection can confer some long-term protection. There is also some evidence that people with blood types B and AB may be partially protected against symptomatic infection, but those with blood group O may be at greatest risk of severe infection. Researchers are trying to develop a vaccine, but it is not possible to grow norovirus in the routine laboratory and there are so many strains that no one vaccine could protect against all of them.

Detection

Testing for the virus is unnecessary in domestic cases of norovirus as the illness is self-limiting and there are no specific treatments. However, molecular biology tests are available to detect norovirus RNA in shellfish and can also be used to find it in faecal and environmental samples. When stool tests are inconclusive, blood tests may be done to detect antibodies to norovirus.

Faecal testing is helpful in outbreaks to identify the source of infection, particularly if the illness is food-related, so that the appropriate measures can be taken.

Control/prevention

▷ At home

Practising good hygiene is vital for infected people - thorough hand washing (especially after using the toilet) and disinfecting contaminated surfaces will limit the risk of passing on the infection. Direct contact with others should be avoided for 48 hours and food should not be prepared for 3 days after symptoms have stopped. Contaminated linen and clothing following sickness must be removed and washed. Make sure the toilet is flushed and clean. It makes sense never to eat raw shellfish or unwashed produce.

Infected people are also advised not to visit the doctor's surgery or present themselves at hospital A & E departments unnecessarily, to avoid introducing the virus to patients or community settings. People who are concerned should phone their doctor or NHS Direct.

▷ In healthcare settings

Taking action early in an outbreak (4 days) by closing wards reduces the impact of the outbreak. Gloves should be used by cleaners and strict hygiene measures should be implemented. Norovirus can survive temperatures up to 60°C and 10 p.p.m. chlorine (above levels used in public water systems). It is rapidly inactivated by chlorine-based disinfectants, but less susceptible to alcohols and detergents.

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