How to prevent the spread of norovirus

In this article...
- The impact of norovirus on healthcare resources
- Key symptoms and how the virus is transmitted
- How to prevent the spread of norovirus

Norovirus has a significant impact on healthcare resources. Nurses can help to prevent its spread by maintaining good hand hygiene and infection control measures.
In addition, Teunis et al (2008) found that the infectivity of the prototype Norwalk virus does not alter by passage through an infected host. Outbreaks therefore occur easily and secondary infections have an equally devastating, if temporary, effect.

Containing infection

There is no specific treatment for norovirus infection and no vaccines available. Short-term immunity is known to build up but, as the virus appears in different strains, existing antibodies will give no protection against later outbreaks.

Due to norovirus's high infectivity and persistence in the environment, its transmission is difficult to control through routine sanitary measures. Stringent hygiene practice is therefore key to containing this disease.

For example, monitoring cleaning of ships' toilet areas revealed that cleaning to a level higher than what would normally be acceptable significantly reduced the likelihood of norovirus outbreaks on board (Carling et al, 2009).

In healthcare, stringent measures must be taken to avoid cross-infection between patients, as well as between patients and staff or other possible contacts in hospital. A proactive approach to hygiene seems appropriate since transmission is possible before symptoms appear.

The Health Protection Agency (2011) has published guidelines on the management of outbreaks in health and social care settings.

Hand decontamination

During an outbreak of norovirus, the HPA (2011) recommends using liquid soap and warm water as part of the World Health Organization 5 Moments of Hand Hygiene for hand decontamination. Patients and visitors should also be urged, and assisted if necessary, to wash and dry hands and understand why this is important.

Handwashing with soap and water is one of the most important processes in

People affected

While anyone can become infected, young children and older people are at a higher risk of dehydration than others from failure to retain fluids.

A study of children hospitalised with either rotavirus or norovirus concluded that norovirus was a major cause of gastroenteritis in children and could cause non-febrile convulsions, particularly in young infants (Chen et al, 2009). Long-term neurological consequences were uncommon when cases were followed up one year later.

Similarly in adults, although in most cases there appear to be no long-term effects, norovirus may occasionally pose some risk.

Harris et al (2008) studied the relationship between norovirus infection and cause of death in older people aged 65 or over. They estimated that an average of 80 deaths per year in England and Wales might be associated with norovirus gastroenteritis, after analysing death registration data from the Office for National Statistics together with laboratory results from the HPA for 2001-06.

How contagious is norovirus?

The faecal-oral route is recognised as the main mode of transmission. The CDC (2011) states: “Norovirus is transmitted by hands contaminated through the faecal-oral route, directly from person to person, through contaminated food or water, or by contact with contaminated surfaces or fomites. Aerosolised vomitus has also been implicated as a transmission mode.”

The well-known contagious nature of the infection appears to be attributable to three notable disease features:

» A minute inoculum can start an infection - as few as 10 viral particles can cause infection (Centers for Disease Control and Prevention, 2007);

» Infected people are themselves infectious before developing symptoms, for example an American football team unknowingly infected by a food source eaten before a game passed the virus on to the opposing team, only later suffering vomiting and diarrhoea (Becker et al, 2000);

» The virus does not decrease in contagiousness or pathogenicity during outbreaks (Teunis et al, 2008).

In addition, Teunis et al (2008) found that the infectivity of the prototype Norwalk virus does not alter by passage through an infected host. Outbreaks therefore occur easily and secondary infections have an equally devastating, if temporary, effect.

Containing infection

There is no specific treatment for norovirus infection and no vaccines available. Short-term immunity is known to build up but, as the virus appears in different strains, existing antibodies will give no protection against later outbreaks.

Due to norovirus’s high infectivity and persistence in the environment, its transmission is difficult to control through routine sanitary measures. Stringent hygiene practice is therefore key to containing this disease.

For example, monitoring cleaning of ships’ toilet areas revealed that cleaning to a level higher than what would normally be acceptable significantly reduced the likelihood of norovirus outbreaks on board (Carling et al, 2009).

In healthcare, stringent measures must be taken to avoid cross-infection between patients, as well as between patients and staff or other possible contacts in hospital. A proactive approach to hygiene seems appropriate since transmission is possible before symptoms appear.

The Health Protection Agency (2011) has published guidelines on the management of outbreaks in health and social care settings.

Hand decontamination

During an outbreak of norovirus, the HPA (2011) recommends using liquid soap and warm water as part of the World Health Organization 5 Moments of Hand Hygiene for hand decontamination. Patients and visitors should also be urged, and assisted if necessary, to wash and dry hands and understand why this is important.

Handwashing with soap and water is one of the most important processes in

5 key points

1 Norovirus is one of the major organisms responsible for viral gastroenteritis

2 While debilitating, infections are usually self-limiting and generally not harmful in the long term

3 Symptoms include vomiting, non-bloody diarrhoea, abdominal cramps and nausea

4 Young children and older people are at risk of dehydration; the virus has been linked to cause of death in older people

5 Good hand hygiene is vital to prevent the virus spreading

People affected

While anyone can become infected, young children and older people are at a higher risk of dehydration than others from failure to retain fluids.

A study of children hospitalised with either rotavirus or norovirus concluded that norovirus was a major cause of gastroenteritis in children and could cause non-febrile convulsions, particularly in young infants (Chen et al, 2009). Long-term neurological consequences were uncommon when cases were followed up one year later.

Similarly in adults, although in most cases there appear to be no long-term effects, norovirus may occasionally pose some risk.

Harris et al (2008) studied the relationship between norovirus infection and cause of death in older people aged 65 or over. They estimated that an average of 80 deaths per year in England and Wales might be associated with norovirus gastroenteritis, after analysing death registration data from the Office for National Statistics together with laboratory results from the HPA for 2001-06.

How contagious is norovirus?

The faecal-oral route is recognised as the main mode of transmission. The CDC (2011) states: “Norovirus is transmitted by hands contaminated through the faecal-oral route, directly from person to person, through contaminated food or water, or by contact with contaminated surfaces or fomites. Aerosolised vomitus has also been implicated as a transmission mode.”

The well-known contagious nature of the infection appears to be attributable to three notable disease features:

» A minute inoculum can start an infection - as few as 10 viral particles can cause infection (Centers for Disease Control and Prevention, 2007);

» Infected people are themselves infectious before developing symptoms, for example an American football team unknowingly infected by a food source eaten before a game passed the virus on to the opposing team, only later suffering vomiting and diarrhoea (Becker et al, 2000);

» The virus does not decrease in contagiousness or pathogenicity during outbreaks (Teunis et al, 2008).

In addition, Teunis et al (2008) found that the infectivity of the prototype Norwalk virus does not alter by passage through an infected host. Outbreaks therefore occur easily and secondary infections have an equally devastating, if temporary, effect.

Containing infection

There is no specific treatment for norovirus infection and no vaccines available. Short-term immunity is known to build up but, as the virus appears in different strains, existing antibodies will give no protection against later outbreaks.

Due to norovirus’s high infectivity and persistence in the environment, its transmission is difficult to control through routine sanitary measures. Stringent hygiene practice is therefore key to containing this disease.

For example, monitoring cleaning of ships’ toilet areas revealed that cleaning to a level higher than what would normally be acceptable significantly reduced the likelihood of norovirus outbreaks on board (Carling et al, 2009).

In healthcare, stringent measures must be taken to avoid cross-infection between patients, as well as between patients and staff or other possible contacts in hospital. A proactive approach to hygiene seems appropriate since transmission is possible before symptoms appear.

The Health Protection Agency (2011) has published guidelines on the management of outbreaks in health and social care settings.

Hand decontamination

During an outbreak of norovirus, the HPA (2011) recommends using liquid soap and warm water as part of the World Health Organization 5 Moments of Hand Hygiene for hand decontamination. Patients and visitors should also be urged, and assisted if necessary, to wash and dry hands and understand why this is important.

Handwashing with soap and water is one of the most important processes in
controlling cross-contamination and avoiding infection.

As part of the Germs: Wash Your Hands of Them campaign, Health Protection Scotland provided infection control resources including poster material on the 5 Moments for Hand Hygiene, guidance for effective hand sanitising and policies for infection control (tinyurl.com/HPSc-resources). HPS (2009) reported an increase in compliance with hand hygiene from 68% to 93% as a result of this campaign.

The NHS in England ran the Cleanyour-hands campaign to encourage hand hygiene (www.npsa.nhs.uk/cleanyour-hands). The WHO has a SAVE LIVES: Clean Your Hands global annual campaign (tinyurl.com/who-hands-global).

Environmental decontamination

During an outbreak of norovirus, the HPA (2011) recommends cleaning and removal of organic soiling with detergent before disinfection to maximise the effectiveness of surface disinfectants. It suggests disinfection is carried out using 0.1% sodium hypochlorite (1,000ppm available chlorine) following manufacturers’ guidelines.

Recommendations for environmental decontamination during an outbreak include:

» Pay attention to frequently touched surfaces such as bed tables and door handles;
» Cleaning and other staff should follow standard infection control procedures and wear personal protective clothing including gloves and aprons.

Outbreak control measures recommended by the HPA are listed in Box 1.

Conclusion

Notovirus is a highly infectious virus and causes a severely unpleasant gastroenteritis. In healthcare, outbreaks have organisational and financial implications. Strict hygiene routines and an appropriate response are essential to avoid outbreaks, contain them or minimise their consequences.

References

Narayan N, Albrecht H (Unpublished) Viral agents of gastrointestinal disease. In: Microbiology and Immunology On line. University of South Carolina School of Medicine. tinyurl.com/gastro-virus

Source: HPA (2011)