A NOROVIRUS GASTROENTERITIS EPIDEMIC IN A LONG-TERM–CARE FACILITY

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ABSTRACT

BACKGROUND: In Victoria, Australia, from July to December 2002, 126 outbreaks of viral and suspected viral gastroenteritis were reported in healthcare institutions. Norovirus was found to account for at least 77 of the 126 outbreaks.

METHODS: In October 2002, the infection control unit investigated an outbreak of acute gastroenteritis on three wards in a 500-bed, long-term–care facility in Melbourne, Victoria, Australia. Cohorting and other infection control measures were initiated.

RESULTS: The outbreak was controlled 32 days after the first symptoms of acute gastroenteritis were identified. Fifty-two patients and 11 staff members were affected. Norovirus genotype 2 was detected on two of the three wards. Norovirus was not isolated in the third ward but was suspected to be the causative organism.

CONCLUSIONS: Outbreaks of viral gastroenteritis can cause significant morbidity in a long-term–care facility, affecting both patients and staff. In addition, the transmission of viral pathogens can be well established before there is recognition of an outbreak (*Infect Control Hosp Epidemiol* 2005;26:256-258).

In 2003, the Centers for Disease Control and Prevention reported increased circulation of norovirus. It is the most common cause of gastrointestinal disease in the United States, with an estimated 23 million cases occurring annually.[1] In Victoria, there were 126 outbreaks of viral or suspected viral gastroenteritis in healthcare institutions between July and December 2002.[2] Acute gastroenteritis is common in Australia, with estimates suggesting that the incidence is approximately one episode per individual per year.[3] Norovirus genotype 2 is the genetic group most commonly associated with outbreaks of gastroenteritis in nursing homes and hospitals.[3] Surveillance conducted in England and Wales during 1992 to 2000 found that a death occurred in 2% of all outbreaks. This questions the belief that norovirus gastroenteritis is a trivial disease.[4]

We describe the epidemiology of a norovirus outbreak that occurred in an Australian long-term–care facility and the control measures used to contain it.

Several viruses associated with acute gastroenteritis were discovered in the 1960s and 1970s, which were transmitted by a food-borne or waterborne route. The noroviruses that have become important causes of both sporadic and epidemic gastroenteritis were among them. Humans are the only known reservoir for norovirus, and the virus has been found to be the most important cause of gastroenteritis in infants and young children worldwide.[5]

Norovirus belongs to the group of small round structured viruses and until recently was known as Norwalk virus, named after the town in Ohio where the first recognized outbreak was described.[6]

The disease is a typical gastroenteritis. Symptoms include nausea, vomiting (often projectile), diarrhea, and stomach cramps. It is estimated that 30% of infected individuals may be asymptomatic.[3] Vomiting and diarrhea can occur with little or no warning. Patients may also suffer headache, fever, chills, and muscle aches. Most reported outbreaks occur where individuals live in close proximity to each other. Hence, problems can occur in facilities for the elderly.[7]

Norovirus is extremely infectious and requires a small inoculum for infection (10 to 100 organisms). This makes control of person-to-person spread more difficult.[6] Infection can be acquired through consuming contaminated food or water, by contact with an infected individual via the fecal–oral route, or by contact with a patient's vomitus, perhaps sometimes via aerosol.[6] The incubation period varies from 10 to 70 hours but is usually 24 to 48 hours. The illness usually resolves within 24 to 48 hours but may last a week or longer.[6]

Person-to-person transmission, particularly in the setting of a long-term–care facility, has important implications for infection control procedures.[7]

In a 2003 study in Melbourne, Victoria, Australia,

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norovirus was detected in 11.4% of gastroenteritis cases in both adults and children, and symptoms associated with norovirus were significantly more severe than those associated with other agents.[8]

METHODS

In October 2002, three wards within a 500-bed, long-term–care facility, Southern Health, located in Melbourne, Victoria, Australia, notified the infection control and epidemiology unit that acute gastroenteritis was occurring among patients and staff. The affected wards were located on different floors of the facility or were in separate blocks of the building.

Ward A

On October 10, 2002, the infection control unit was notified that five patients on ward A, a psychogeriatric ward, had symptoms of acute gastroenteritis. However, with further investigation, 11 of the 22 patients on ward A were found to be symptomatic. Infection control measures were instituted. A total of 17 patients and 7 staff members were infected during the outbreak on ward A, which lasted 7 days. The ward was reopened 10 days after the outbreak was identified and no new cases occurred. It was unclear who the index case was. On investigation of food services, we did not identify a common food source for the outbreak.

Ward B

On October 25, 2002, 16 days after the initial outbreak began, ward B notified the infection control unit that 8 patients and 2 staff members had symptoms of gastroenteritis. Infection control measures were instituted during this second outbreak, which lasted 3 days, with a total of 11 infected patients and 3 infected staff members. Ward B was reopened 5 days after the outbreak was identified and no new cases occurred. It is unclear how transmission between wards A and B occurred, but the most likely mechanism was believed to be through staff.

Ward C

Three weeks (22 days) after the first outbreak was identified, ward C notified the infection control unit that 7 patients had symptoms of gastroenteritis. Ward C was closed to transfers into and out of the ward, and infection control measures were initiated. The outbreak lasted 7 days, during which a total of 24 patients and 4 staff members became infected. Ward C was reopened 5 days after the outbreak was identified and no new cases occurred.

Control Measures

To control the outbreak, the Victoria Department of Human Services guideline, "Controlling an Outbreak of Gastroenteritis: Guidance for Institutions," was implemented by the infection control team.[9] Control measures included no transfers of patients between wards or to other institutions. The patients on wards B and C were cohorted, and hand hygiene was actively promoted for staff and patients with alcohol-based handrub available at every bedside. For cleaning, gowns and gloves were worn, and cleaning was conducted using detergent and water and then a 1,000-ppm solution of sodium hypochlorite. Wards remained closed to new admissions and staff worked on a single ward only. Visiting was restricted as much as possible and exposed food such as fruit was discarded.

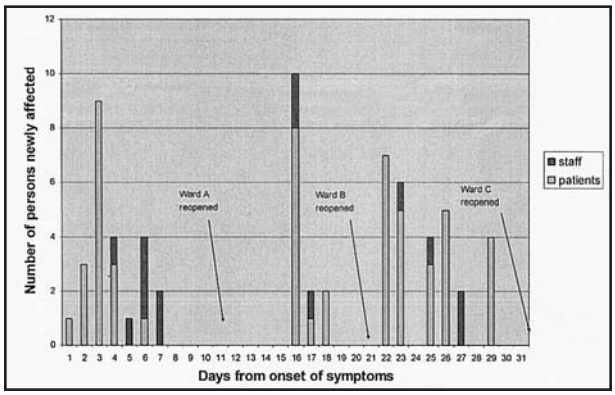

FIGURE. Epidemic curve of the outbreak of norovirus gastroenteritis.

All staff were told about the mechanism of transmission of gastroenteritis, cleaning and disinfection procedures, isolation, transfers, and discharge. They were informed that ill staff must not return to work until 48 hours after the resolution of their symptoms. Contact information for the infection control team was widely distributed. However, cohorting was not performed on ward A, the psychogeriatric ward, because it was considered to be too disruptive. Good hand hygiene was emphasized and an alcohol-based handrub was available at every bedside. Staff members were educated about the mechanism of transmission of gastrointestinal viruses, and those who became infected were instructed not to return to work until 48 hours after their symptoms resolved. The ward remained closed to new admissions and staff did not rotate between wards. Visitors were restricted and exposed food was discarded. Because of its high infectivity and persistence in the environment, transmission of norovirus is difficult to control through routine sanitary procedures. Therefore, cleaning included detergent and water, followed by a 1,000-ppm solution of sodium hypochlorite.

RESULTS

The outbreak in the long-term–care facility was controlled 32 days after the first report of symptoms of acute gastroenteritis. Stool specimens were collected from all symptomatic patients and approximately 20% of the symptomatic staff. Fifty-two patients and 11 staff members were affected (Figure). Bacterial cultures were negative, but norovirus genotype 2 was detected by polymerase chain reaction for one patient on ward A and another on ward B. Norovirus testing ceased after these results and was not conducted for other specimens from wards A, B, or C because norovirus genotype 2 was considered the most likely cause on the three wards.

Although it was unclear who the index case was on each ward, an investigation of food services did not identify a common food source in the outbreak. Fortunately, no patients became ill enough to be transferred to an acute care facility, and none required rehydration with an intravenous device.

DISCUSSION

The main focus of controlling the outbreak was hand hygiene and cleaning. In a study reported in 2002, approximately one-third of subjects were still excreting the virus up to 3 weeks after the onset of illness. The relatively long-term excretion of norovirus raises questions about infection control guidelines that allow the return of staff to facilities 48 hours after the cessation of symptoms.[6]

However, no new cases occurred, and having staff not return to work until 48 hours after their symptoms resolved occasionally became an issue when staff were not eligible for sick leave and when the ward manager was concerned about staffing levels. Regarding the latter, when the wards were closed to new admissions, staffing requirements were reduced. It was not surprising that norovirus genotype 2 was found on two wards because it is most commonly associated with outbreaks in nursing homes and hospitals.

Outbreaks of viral gastroenteritis can cause significant morbidity in a long-term–care facility. The transmission of viral pathogens can be well established before there is recognition of an outbreak. The long-term excretion of norovirus may not be adequately addressed by infection control guidelines when staff and patients are reclassified as non-infectious 48 hours after the cessation of symptoms.

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