Emergence of norovirus strain GII.4 Sydney (2012) in BC

Noroviruses are extremely contagious viruses and the leading cause of gastroenteritis worldwide. Noroviruses cause an acute illness characterized by vomiting, diarrhea, cramping, and fever. Onset of symptoms typically occurs 12 to 48 hours after exposure. Norovirus causes a mild self-limiting infection; most people will recover within 1 to 3 days without medical treatment.

This infection is spread from human to human via the fecal-oral route or through the aerosolization of vomitus. Spread of norovirus is primarily through person-to-person transmission, via contaminated surfaces, food, and water. Noroviruses are able to spread quickly because of a low infectious dose (as low as 18 virions), and the virus is shed in high numbers in the vomitus and stool of infected patients and is resistant to some disinfectants.

Norovirus, unlike other viral gastroenteric microorganisms, infects individuals across all age ranges. As such, outbreaks of norovirus occur in many settings including hospitals, residential care facilities, day cares, schools, restaurants, and cruise ships. The illness is sometimes called the "winter vomiting illness" as it occurs primarily between November and April, although norovirus activity can occur year round. Globally, a trend of pandemic waves are observed every 2 to 3 years, as a new strain replaces a previously circulating strain, resulting in an increased incidence of norovirus throughout the population. In 2009 norovirus strain GII.4K New Orleans emerged and was the dominant circulating strain globally until recently. Because strain replacement occurs frequently, it is difficult to establish lasting immunity to norovirus.

At the BCCDC Public Health Microbiology and Reference Laboratory Environmental Microbiology Program, norovirus testing by real-time reverse-transcriptase polymerase chain reaction (RT-PCR) is offered for gastroenteritis outbreak investigations in British Columbia. From October to December 2012, the environmental microbiology laboratory observed a marked increase in the number of reported gastroenteritis outbreaks across BC compared with previous seasons. The number of reported gastroenteritis outbreaks stabilized in January 2013 to typical volumes. The majority of these outbreaks were caused by norovirus, as determined by real-time RT-PCR.

To track the transmission patterns of norovirus in BC, the environmental microbiology laboratory genotypes outbreak samples using sequence analysis. Genotyping analysis of recent outbreak strains identified a novel norovirus variant that had not previously been observed in BC. This strain, named GII.4 Sydney (2012), was first identified in Sydney, Australia, in March 2012 and has been observed in New Zealand, the United States, Belgium, and Denmark.[1] In BC, sequencing has revealed that GII.4 Sydney (2012) has replaced GII.4K New Orleans as the dominant circulating norovirus strain (**Figure**).

The key to preventing the spread of norovirus infection is good infection control practices. Information on good hand hygiene and infection control in facilities is provided by the

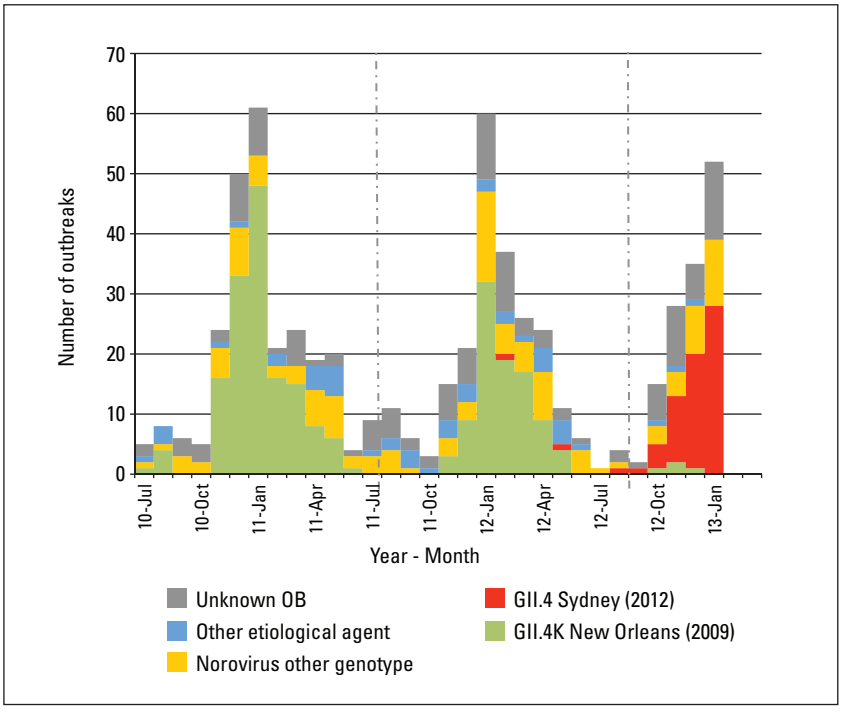

Figure. Strain replacement of norovirus in BC, July 2010–January 2013.

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Provincial Infection Control Network (www.picnetbc.ca). The best infection prevention mechanism is frequent and effective hand hygiene, using hand washing with soap and water or alcohol-based hand sanitizers. Other key measures include excluding health care providers with norovirus symptoms when sick, using personal protective equipment (gloves and masks) when interacting with norovirus patients, and cleaning contaminated surfaces with appropriate disinfectants.

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Reference

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