Norovirus surveillance system provides near real-time tracking of cases
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Noroviruses are the predominant cause of foodborne illness in the United States. Since Food and Drug Administration licensure of the two currently available rotavirus vaccines in the U.S. in 2006 and 2008, noroviruses have become the leading cause of pediatric viral gastroenteritis.

Noroviruses are genetically diverse and are classified into at least six known genogroups and are further subdivided into at least 38 genetic clusters (genotypes). Worldwide, genogroup II genotype 4 has been the predominant virus for the past decade. However, new variant strains emerge within this genotype every two to four years and frequently are associated with increased disease burden.

Norovirus gastroenteritis is characterized by sudden onset of nausea, vomiting, watery diarrhea and abdominal cramps that develop following a 12- to 48-hour incubation period. Systemic symptoms such as fever, malaise, myalgia and headache also may occur. Symptoms typically last 24 to 60 hours, but longer courses can occur in young children and the elderly in whom dehydration can be a major problem.

Reverse-transcriptase polymerase chain reaction or enzyme immunoassay testing of stool specimens can confirm the diagnosis. Treatment of norovirus gastroenteritis is supportive, including oral or intravenous hydration.

Noroviruses are environmentally stable and can be transmitted from person-to-person, through consumption of contaminated food or water and through contact with contaminated environmental surfaces. Several factors promote spread of noroviruses, including a low infectious dose, large numbers of viral particles in stool and vomitus, and prolonged viral shedding. Additionally, asymptomatic excretion is common in all age groups, especially young children.

Hand hygiene is the most important method for preventing transmission of noroviruses. Washing hands with soap and water has been shown to be more effective than use of alcohol-based gels.

Since 2009, the Centers for Disease Control and Prevention (CDC) has performed an enhanced nationwide surveillance of norovirus outbreaks.

The CDC began obtaining epidemiologic data on norovirus outbreaks through the National Outbreak Reporting System (NORS) and CaliciNet in 2009. NORS is a web-based platform for health departments to report waterborne, foodborne and enteric disease outbreaks of all etiologies, including norovirus. CaliciNet is a nationwide electronic surveillance system of local and state public health and regulatory agency laboratories that collects genetic sequences of norovirus strains associated with gastroenteritis outbreaks.

In 2012, the NoroSTAT surveillance system was implemented in five states (Minnesota, Ohio, Oregon, Tennessee and Wisconsin). NoroSTAT was designed to integrate the NORS and CaliciNet systems and thereby reduce reporting lags and incomplete reporting of norovirus cases. The referenced MMWR article reports data collected between the three-year periods before and after introduction of the NoroSTAT network.

Implementation of NoroSTAT was associated with a significant decrease in reporting time - from a median of 21 days to three days - resulting in near real-time monitoring of outbreaks in these five states. NoroSTAT states
also demonstrated a significant increase in linkage of outbreak data between the NORS and CaliciNet systems from 86% to 95%. More modest improvements were seen in non-NoroSTAT states, which was attributed to improvements in the reporting interface and increased engagement among reporting agencies. Nationwide, the most common mode of transmission was person-to-person, and outbreaks occurred most frequently in long-term care facilities.

As of August 2016, NoroSTAT was expanded to include nine states (Massachusetts, Michigan, South Carolina and Virginia were added to the initial five sentinel sites). Data collected are representative of national trends, which can help inform public health response. The NoroSTAT network has demonstrated a key advancement in norovirus outbreak surveillance by providing near real-time monitoring of norovirus outbreak activity and emerging new strains.

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Quiz

Which of the following statements are true?

A. The NoroSTAT network has reduced the median interval for reporting of norovirus outbreak data from 21 days to three days.

B. Norovirus is the most common cause of pediatric viral gastroenteritis in the United States.

C. The most frequent norovirus transmission mode is person-to-person.

D. States in the NoroSTAT network had more complete reports that better linked epidemiologic and laboratory data.

E. All of the above

Answer: E.

Resource

- More information on noroviruses can be found in the AAP Red Book.