Washoe County Health District

EPI - NEWS

Page 1 of 2

In This Issue:
- A better understanding of norovirus

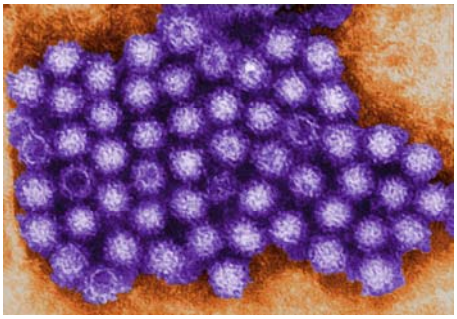
March 11, 2011
Vol. 31, No. 6
Telephone (775) 328-2447
Fax (775) 328-3764
epicenter@washoecounty.us

WASHOE COUNTY HEALTH DISTRICT • P.O. BOX 11130 • RENO, NEVADA • 89520-0027 • (775) 328-2447

A Better Understanding of Norovirus

Background

Noroviruses belong to the genus *Norovirus*, and the family *Caliciviridae*. They are a group of related, single-stranded RNA, nonenveloped viruses that cause acute gastroenteritis in humans. Norovirus was recently approved as the official genus name for the group of viruses provisionally described as "Norwalk-like viruses" (NLV).



Other genera within the *Caliciviridae* family include *Sapovirus*, which also causes acute gastroenteritis (AGE) in persons, as well as *Lagovirus, Vesivirus, and Nebovirus,* which are not pathogenic for humans.

This article compiles local data with recent advances in knowledge on noroviruses from the newly published recommendations "Updated Norovirus Outbreak Management and Disease Prevention Guidelines" released March 4, 2011 by the Centers for Disease Control and Prevention. [1]

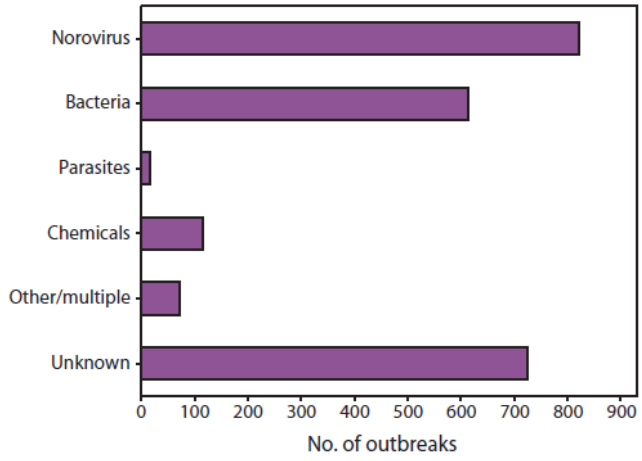
Worldwide, Nationwide & Local Disease Burden

Noroviruses are the most common cause of epidemic gastroenteritis, responsible for at least 50% of all gastroenteritis outbreaks worldwide, and a major cause of foodborne illness.

In the United States, approximately 21 million illnesses attributable to norovirus are estimated to occur annually. Recent studies suggest that norovirus is the leading cause of acute gastroenteritis in the community and among persons seeking care in outpatient clinics or emergency departments across all age groups. Norovirus is now recognized as the leading cause of foodborne disease outbreaks in the United States. Norovirus accounted for 822 (35%) of the 2,367 foodborne disease outbreaks reported to CDC during 2006-2007 (Figure 1).

Locally, norovirus accounted for 68 (46%) of the 147 disease outbreaks reported in Washoe County during the period of 2006-2010 (range: 32%-75% annually) and resulted in more than 2,000 reported ill individuals. It is important to note that the actual disease burden is far greater than 2,000 illnesses as sporadic cases are not reportable.

Figure 1. Number of foodborne disease outbreaks reported to CDC, by etiology – USA, 2006-2007



Biology

Noroviruses can be divided into at least five genogroups, designated GI-GV, based on amino acid identity in the major structural protein. The strains that infect humans are found in GI, GII, and GIV, whereas the strains infecting cows and mice are found in GIII and GV, respectively. Although interspecies transmission of noroviruses has not been documented, strains that infect pigs are found in GII, and a GIV norovirus was discovered recently as a cause of diarrhea in dogs, suggesting the potential for zoonotic transmission. Noroviruses can be classified further into genotypes, with at least eight genotypes belonging to GI and 21 genotypes belonging to GII. Since 2001, GII-4 viruses have been associated with the majority of viral gastroenteritis outbreaks worldwide (Figure 2). In Washoe County GII virus is the most prevalent genogroup; however, no genotype information has been available locally.

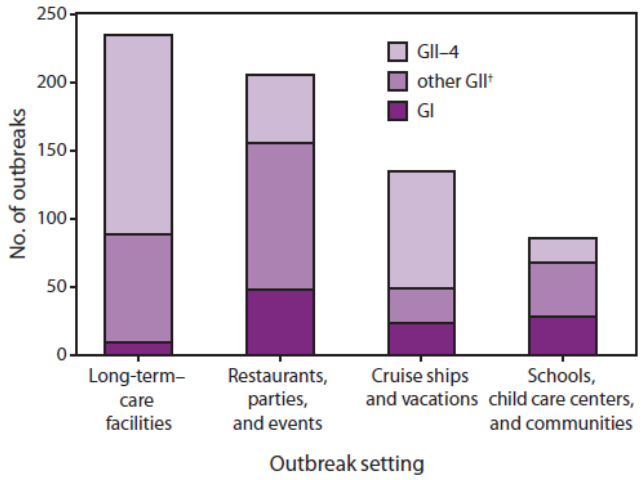
Clinical Features You May Not Be Aware Of

- Approximately 10% of persons with norovirus gastroenteritis seek medical attention, which might include hospitalization and treatment for dehydration with oral or intravenous fluid therapy.

[1] CDC. Updated Norovirus Outbreak Management and Disease Prevention Guidelines. MMWR 2011;60 (No.RR-3).

Please share this document with all physicians & staff in your facility/office.

Figure 2. Number of norovirus outbreaks laboratory-confirmed by CDC, by setting and genotype – USA, 1994-2006



- Norovirus is shed primarily in the stool but also can be found in the vomitus of infected persons.
- The virus can be detected in stool for an average of 4 weeks following infection, although peak viral shedding occurs 2-5 days after infection, with a viral load of approximately 100 billion viral copies per gram of feces; however, whether these viruses represent infectious virus is unknown.
- Time after illness at which an infected person is no longer contagious is unknown.
- Up to 30% of norovirus infections are asymptomatic. The role of asymptomatic infection in transmission and outbreaks of norovirus remains unclear.

Immunity

Protective immunity to norovirus is complex and incompletely understood. In human challenge studies, infected volunteers were susceptible to reinfection with the same strain as well as to infection with heterologous strains. Some studies demonstrated that homologous antibody protection might last anywhere from 8 weeks to 6 months.

Communicability & Transmission

Norovirus is extremely contagious, with an estimated infectious dose as low as 18 viral particles, suggesting that approximately 5 billion infectious doses might be contained in each gram of feces (approximately equivalent to 2.5 billion infectious doses in peanut size feces) during peak shedding (2-5 days after infection). Transmission in humans generally occurs by three different routes:

- Person-to-person transmission might occur directly through the fecal-oral route, by ingestion of aerosolized vomitus, or by indirect exposure via fomites or contaminated environmental surfaces,
- Foodborne transmission, and
- Waterborne transmission.

Diagnostic Methods

Three methods are available for norovirus detection:

- Real-time reverse transcription-polymerase chain reaction (RT-PCR) assay. This test is available at both local commercial labs LabCorp (test code 138307) and Quest (test code 19098) as well as at the Nevada State Public Health Laboratory (NSPHL).
- Conventional RT-PCR) Assays. Available at CDC for the genotyping of norovirus. Also available at NSPHL for DNA sequencing for research needs upon the health jurisdictions' request. Not available for regular diagnostic purposes.
- Enzyme Immnoassays (EIA) are rapid assays and might be useful for preliminary screening of norovirus in an outbreak investigation. This test is only available at Quest (test code 181106).

Specimen Collection

Stool specimens collected within 48-72 hours after onset are the most appropriate samples for detecting norovirus. Specimens of vomitus can be collected to supplement the diagnostic yield from stool specimens during an investigation. Serum specimens might be useful for special studies but are not recommended for routine diagnostics.

Hand Hygiene vs. Alcohol-based Sanitizers

The efficacy of alcohol-based and other hand sanitizers against norovirus remains controversial, with mixed evidence depending on the product formulation and evaluation methodology. Hand hygiene using soap and water for 20 seconds is the single most important method for prevention of disease and control of transmission.

Exclusion and Isolation

CDC recommends that ill staff members in health-care facilities and ill food handlers should be excluded during their illness and for 48-72 hours following resolution of symptoms. During outbreaks, the Health District currently recommends exclusion for 72 hours following *resolution of symptoms* for individuals working in sensitive occupations (including food handlers, day care attendees or providers, and residents and employees of community living facilities such as extended care facilities, assisted/independent living facilities, and group homes).

Reporting

Sporadic norovirus is not reportable in Nevada; however, any suspect outbreak of norovirus or other diseases is reportable per Nevada law (NAC 441A). To report an outbreak or a suspected outbreak, please call **775-328-2447** or fax to **775-328-3764.**