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Foodborne Illnesses: Viruses

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Foodborne Illnesses: Viruses

Viral Gastroenteritis

Gastroenteritis means inflammation of the stomach and small and large intestines. Viral gastroenteritis is an infection caused by a variety of viruses that result in vomiting or diarrhea. It is often called the “stomach flu,” although it is not caused by the influenza viruses.

What Causes Viral Gastroenteritis? Many different viruses can cause gastroenteritis, including rotaviruses, noroviruses, adenoviruses, sapoviruses and astroviruses. Viral gastroenteritis is not caused by bacteria (such as *Salmonella* or *E. coli*), or parasites (such as *Giardia*), or by medications or other medical conditions, although the symptoms may be similar. Your doctor can determine if the diarrhea is caused by a virus or by something else.

What are the Symptoms of Viral Gastroenteritis? The main symptoms of viral gastroenteritis are watery diarrhea and vomiting. The affected person may also have headache, fever and abdominal cramps (“stomach ache”). In general, the symptoms begin one to two days following infection with a virus that causes gastroenteritis and may last for one to 10 days, depending on which virus causes the illness.

Is Viral Gastroenteritis a Serious Illness? For most people, it is not. People who get viral gastroenteritis almost always recover completely without any long-term problems. Gastroenteritis is a serious illness, however, for persons who are unable to drink enough fluids to replace what they lose through vomiting or diarrhea. Infants, young children and persons who are unable to care for themselves, such as the disabled or elderly, are at risk from dehydration because of loss of fluids. Immune-compromised persons are at risk from

dehydration because they may get a more serious illness, with greater vomiting or diarrhea. They may need to be hospitalized for treatment to correct or prevent dehydration.

Is the Illness Contagious? How are these Viruses Spread? Yes, viral gastroenteritis is contagious. The viruses that cause gastroenteritis are spread through close contact with infected persons (for example, by sharing food, water or eating utensils). Individuals may also become infected by eating or drinking contaminated foods or beverages.

How Does Food Get Contaminated by Gastroenteritis Viruses? Food may be contaminated by food preparers or handlers who have viral gastroenteritis, especially if they do not wash their hands regularly after using the bathroom or changing diapers. (See hand-washing instructions below.)

Shellfish may be contaminated by sewage. Persons who eat raw or undercooked shellfish harvested from contaminated waters may get diarrhea. Drinking water can also be contaminated by sewage and be a source of the spread of these viruses.

Where & When Does Viral Gastroenteritis Occur? Viral gastroenteritis affects people in all parts of the world. Each virus has its own seasonal activity. For example, in the United States, rotavirus and astrovirus infections occur during the cooler months of the year (October to April), whereas adenovirus infections occur throughout the year. Norovirus outbreaks can occur in institutional settings — such as schools, child care facilities, and nursing homes — and can occur in other group settings, such as banquet halls, cruise ships, dormitories and campgrounds.

Who Gets Viral Gastroenteritis? Anyone can get it. Viral gastroenteritis occurs in people of all ages and backgrounds. However, some viruses tend to cause diarrheal disease primarily among people in specific age groups. Rotavirus and norovirus infections are the most common cause of diarrhea in infants and young children under 5 years old. Adenoviruses and astroviruses cause diarrhea mostly in young children, but older children and adults can also be affected. Diarrhea in older children and adults is more likely caused by noroviruses.

How is Viral Gastroenteritis Diagnosed?

Generally, viral gastroenteritis is diagnosed by a physician on the basis of the symptoms and medical examination of the patient. Rotavirus infection can be diagnosed by laboratory testing of a stool specimen. Tests to detect other viruses that cause gastroenteritis are not in routine use.

How is Viral Gastroenteritis Treated? The most important treatment of viral gastroenteritis in children and adults is to prevent severe loss of fluids (dehydration). This treatment should begin at home. Your physician may give you specific instructions about what kinds of fluid to give.

The Centers for Disease Control (CDC) recommends that families with infants and young children keep a supply of oral rehydration solution (ORS) at home at all times and use the solution when diarrhea first occurs in the child. ORS is available at pharmacies without a prescription. Follow the directions on the ORS package and use clean or boiled water. Medications, including antibiotics (which have no effect on viruses) and other treatments, should be avoided unless specifically recommended by a physician.

Can Viral Gastroenteritis be Prevented? Persons can reduce their chance of getting infected by frequent hand washing (see instructions below), prompt disinfection of contaminated surfaces with household chlorine bleach-based cleaners and prompt washing of soiled articles of clothing. Avoid food or water that is thought to be contaminated. Sanitize cutting boards and other surfaces as needed with 1 teaspoon liquid chlorine bleach per quart of water.

Proper Hand Washing:

- Step 1. Wet hands thoroughly with warm water.
- Step 2. Apply soap generously.
- Step 3. Rub hands for at least 20 seconds.
- Step 4. Scrub under nails with a clean nailbrush.
- Step 5. Rinse hands well with warm water.
- Step 6. Dry hands using a clean paper towel.

Is There a Vaccine for Viral Gastroenteritis?

Currently there is a licensed rotavirus vaccine available that protects against severe diarrhea from rotavirus infection in infants and young children. The vaccine is given in three doses to infants at least 6 weeks old. There is no vaccine or medicine currently available that prevents other forms of viral gastroenteritis.

Norovirus

Norovirus was approved as the official genus name for the group of viruses provisionally described as “Norwalk-like viruses”. At least 50% of all food-borne outbreaks of gastroenteritis can be attributed to noroviruses. Common settings for outbreaks include restaurants and catered meals, nursing homes, schools and vacation settings or cruise ships. Raw oysters, cake frosting and salads, as well as drinking water, have been implicated as a common source of viral infection in several outbreaks.

How is it Spread? Noroviruses are found in the stool or vomit of infected people. People can become infected with the virus in several ways, including:

- eating food or drinking liquids that are contaminated with norovirus;
- touching surfaces or objects contaminated with norovirus; and then placing their hand in their mouth;
- having direct contact with another person who is infected and showing symptoms (for example, when caring for someone with illness, or sharing foods or eating utensils with someone who is ill).

Persons working in day-care centers or nursing homes should pay special attention to children or residents who have norovirus illness. This virus is very contagious and can spread rapidly throughout such environments.

Most foodborne outbreaks of norovirus illness are likely to arise through direct contamination of food by a food worker immediately before it is served. Outbreaks have frequently been associated with the consumption of cold foods, including various salads, sandwiches and bakery products. Liquid items (salad dressing or cake icing) that allow the virus to mix evenly are often implicated as a cause of outbreaks. Food can also be contaminated at its source, and oysters from contaminated waters have been associated with widespread outbreaks of gastroenteritis. The ingestion of raw or insufficiently steamed clams and oysters poses a high risk for infection.

Waterborne outbreaks of norovirus disease in community settings have often been caused by sewage contamination of wells and recreational water.

When do Symptoms Appear? Symptoms of norovirus illness usually begin about 24 to 48 hours after ingestion of the virus and last for 24 to 60 hours. They can appear as early as 12 hours after exposure.

How Long are People Contagious? People infected with norovirus are contagious from the moment they begin feeling ill to at least three days after recovery. Some people may be contagious for as long as two weeks after recovery. Therefore, it is particularly important for people to use good hand-washing and other hygienic practices after they have recently recovered from norovirus illness.

What are the Symptoms & Treatment?

Symptoms include nausea, vomiting, diarrhea and abdominal cramps. Symptoms experienced less often include headache, fever, chills and muscle pain. Norovirus illness is usually brief in healthy individuals. Currently there is no antiviral medication that works against norovirus and there is no vaccine to prevent infection. Norovirus infection cannot be treated with antibiotics. This is because antibiotics work to fight bacteria and not viruses. Fluid replacement is the common therapy.

When people are ill with vomiting and diarrhea, they should drink plenty of fluids to prevent dehydration. Dehydration among young children, the elderly, and the sick, can be common, and it is the most serious health effect that can result from

norovirus infection. By drinking oral rehydration fluids (ORF), juice or water, people can reduce their chance of becoming dehydrated. Sports drinks do not replace the nutrients and minerals lost during this illness.

Can Norovirus Infections Be Prevented?

- Frequently wash your hands, especially after toilet visits and changing diapers and before eating or preparing food.
- Carefully wash fruits and vegetables. Steam oysters before eating them.
- Thoroughly clean and disinfect contaminated surfaces immediately after an episode of illness by using a bleach-based household cleaner.
- Immediately remove and wash clothing or linens that may be contaminated with virus after an episode of illness (use hot water and soap).

Persons who are infected with norovirus should not prepare food while they have symptoms and for three days after they recover from their illness. Food that may have been contaminated by an ill person should be disposed of properly.

Rotavirus

Rotavirus is the leading cause of severe diarrhea among infants and children and accounts for about half of the cases requiring hospitalization. Over three million cases of rotavirus gastroenteritis occur annually in the United States, primarily in the winter.

All age groups are susceptible to rotavirus infection, but children six months to 2 years of age, premature infants, the elderly, and the immune-compromised are particularly prone to more severe symptoms. Outbreaks of rotavirus diarrhea are common among hospitalized infants, young children attending day care centers and elderly persons in nursing homes.

Symptoms & Treatment: The incubation period ranges from one to three days. Symptoms often start with vomiting followed by four to eight days of diarrhea. Temporary lactose intolerance may occur. Recovery is usually complete. Fluid and electrolyte replacement is important especially in cases of severe diarrhea.

Prevention: Person-to-person spread through contaminated hands is probably the most important means by which rotaviruses are transmitted in close communities such as pediatric and geriatric wards, day care centers and family homes. Infected food handlers may contaminate foods that require handling and no further cooking, such as salads, fruits and hors d'oeuvres. Thus the best means of prevention of illness is by proper hand washing after using the bathroom or changing soiled diapers, especially before handling foods.

The U.S. Food and Drug Administration (FDA) has approved a live, oral vaccine for use in children.

Other Gastroenteritis Viruses

Although rotaviruses and noroviruses are the leading causes of viral gastroenteritis, a number of other viruses have been implicated in outbreaks, including astroviruses, caliciviruses, enteric adenoviruses and parvoviruses.

Astroviruses cause sporadic gastroenteritis in children under 4 years of age and account for about 4 percent of the cases hospitalized for diarrhea. Most American and British children over 10 years of age have antibodies to the virus.

Caliciviruses infect children between 6 and 24 months of age and account for about 3 percent of hospital admissions for diarrhea. By 6 years of age, more than 90 percent of all children have developed immunity to the illness.

The enteric adenovirus causes 5 to 20 percent of the gastroenteritis in young children, and is the second most common cause of gastroenteritis in this age group. By 4 years of age, 85 percent of all children have developed immunity to the disease. Parvo-like viruses have been implicated in a number of shellfish-associated outbreaks, but the frequency of disease is unknown.

A mild, self-limiting illness usually develops 10 to 70 hours after contaminated food or water is consumed and lasts for three to nine days. The clinical features are milder but otherwise indistinguishable from rotavirus gastroenteritis. Outbreaks of astrovirus and calicivirus occur mainly in child-care settings and nursing homes.

Hepatitis Viruses

Hepatitis A: Hepatitis A is a liver disease caused by hepatitis A virus. It is usually a mild illness characterized by sudden onset of fever, nausea, vomiting, fatigue and abdominal pain, followed in several days by jaundice (yellowing of the skin and eyes). Other symptoms include pain in the liver area, dark urine and light-colored stools.

The incubation period for hepatitis A varies from 15 to 50 days, which means that infected persons can spread the disease before they realize they have it. Young children often do not show clinical signs of the disease but can still be contagious. The disease is usually mild and recovery complete in one to two weeks. Occasionally, the symptoms are severe and convalescence can take several months. Twenty-two percent of adults are hospitalized, but less than 0.4 percent of reported cases in the United States are fatal.

How is the Hepatitis A Virus Spread? The hepatitis A virus is spread primarily by person-to-person contact by one of the following means:

- Fecal contamination (for example, parents or child-care workers handling soiled diapers).
- Eating food contaminated by food handlers not washing their hands properly after using the bathroom.
- Eating raw or undercooked shellfish from contaminated water.
- Drinking contaminated water (for example when traveling to underdeveloped areas abroad).

The virus is more easily spread in areas where there are poor sanitary conditions or where good personal hygiene is not observed. Most infections result from contact with a household member or sex partner who has hepatitis A. Casual contact, as in the usual office, factory or school setting, does not spread the virus.

Associated Foods: Water, shellfish and salads are the most common sources of contamination. Other foods frequently implicated in outbreaks are cold cuts, sandwiches, fruits, fruit juices, milk, milk products, vegetables, salads, shellfish and iced drinks. Although contamination of foods by infected workers in food processing plants and restaurants can occur, the vast majority of cases are

not caused through contamination of food or water. Hepatitis A is transmitted primarily by person-to-person contact through fecal contamination.

Prevention: Vaccines are now available which provide long-term protection. Individuals who have had hepatitis A will have a lifelong protection against reinfection. (A blood test is available that will show if a person has immunity.) Other preventative measures include proper hand washing after using the bathroom or changing soiled diapers, especially before handling food.

Hepatitis E: Hepatitis E can also be transmitted by the fecal-oral route and can be foodborne. Symptoms are clinically indistinguishable from hepatitis A. Major outbreaks associated with contaminated drinking water have occurred in Asia and North and East Africa, but none in the United States.

Hepatitis B, C and D are usually not foodborne but transmitted through blood or other body fluids.

Sources:

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This information has been reviewed and adapted for use in South Carolina by P.H. Schmutz, HGIC Food Safety Specialist, and E.H. Hoyle, Extension Food Safety Specialist, Clemson University. (New 05/99. Revised 05/07.)

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