

Cholera

Summary

Classic cholera is a condition of severe gastroenteritis occurring in outbreaks with a high mortality rate in untreated patients. All strains of *Vibrio cholerae* and non-cholera *vibrio* can cause asymptomatic infections or sporadic cases of gastroenteritis. Some *Vibrio* species can cause sepsis and/or severe cutaneous infections.

Agent

Cholera is caused by *Vibrio cholerae*, type O1 and O139 that produce cholera toxin. Non-cholera-toxigenic O1 and non O1 strains and non-cholera *vibrio* may be associated with watery diarrhea.

Transmission

Reservoir:

Reside in salt or brackish waters and in crustaceans in contaminated water. There is no long-term human carriage, and no non-human mammal or bird reservoir.

Mode of transmission:

Through ingestion of food or water contaminated directly or indirectly with feces or vomitus of an infected person. Seafood may be surface contaminated by salt water or intrinsically contaminated by harvesting from contaminated waters. Secondary contamination of uncooked food may cause large outbreaks. Usually not transmitted directly from person to person.

Period of communicability:

As long as stools are positive for the organism, usually for only a few days after recovery. Carriage for several months and extended biliary carriage has been reported rarely.

Clinical Disease

Incubation period:

Usually 1-3 days, range few hours to 5 days.

Illness:

The majority of *V. cholerae* infections are subclinical, and mild to moderate diarrhea is common, especially in children. Classic cholera involves the abrupt onset of diarrhea without abdominal pain, cramping or fever; feces are typically watery, voluminous, described as 'rice-water' because they are colorless with shreds of mucous. The volume of enteric output may reach several liters over several hours resulting in fulminant dehydration, hypokalemia, acidosis, hypovolemic shock, coma, and seizures. Death occurs within 12 hours in up to 50% of untreated cases of cholera gravis. Vomiting occurs in many cases. Hypoglycemia may occur in children. Oral rehydration with replacement of electrolytes and provision of carbohydrates to facilitate resumption of normal epithelial cell function will permit the recovery of most patients.

Laboratory Diagnosis

- Maximum yield from fecal, rectal swab, or vomitus culture requires either immediate plating of the specimen on Thiosulfate-citrate-bile salts-sucrose (TCBS) (or similar) agar or transport of the specimen in Cary-Blair transport medium. *Vibrio* species will grow

readily on blood agar but are inhibited by most media that are used for routine culture for *Salmonella* and *Shigella*. The laboratory should be notified when infection with a vibrio species is suspected, since appropriate media is not used routinely by most clinical labs. Vibrio species are readily recovered from routine blood and tissue cultures.

- Retrospective serologic diagnosis can be made by detection of vibriocidal antibodies or antibodies to cholera toxin.

Treatment

- Institute oral or parenteral rehydration and replacement of electrolytes immediately.
- Antibiotic treatment is recommended in moderately to severely ill patients and will reduce severity of illness and decrease excretion of the organism in the stool. Adults may be treated with doxycycline while azithromycin is recommended as first-line treatment for children and pregnant women. or tetracycline for three days. Strains resistant to tetracyclines should be treated with a trimethoprim/sulfamethoxazole (TMP/SMX) or a fluoroquinolone.

Surveillance

Case Definition:

Laboratory criteria - Positive culture of stool or vomitus for toxigenic *V. cholerae* O1 or O139 or serologically by at least a fourfold change in titer of vibriocidal or anti-toxic antibodies in acute/convalescent sera.

Confirmed – A clinically compatible illness that is laboratory confirmed.

Reporting:

Report all suspected or confirmed cases of cholera immediately to the Epidemiology and Response Division (ERD) at 505-827-0006, who will also report to CDC. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. CDC will confirm the identity and serotype (O antigen and toxin) of *V. cholerae* isolates. Cholera is immediately reportable to the World Health Organization (by CDC).

Case Investigation: Use the CDC Cholera and Vibrio Form 52.79 to complete the investigation and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Information should also be entered into NM-EDSS per established procedures.

Control Measures

1. Case management
 - 1.1. Isolation: Contact precautions for the duration of illness.
 - 1.2. Prophylaxis: Not applicable.
2. Contact management
 - 2.1. Isolation: None required.
 - 2.2. Prophylaxis Usually not indicated. Close surveillance for five days after the last meal shared with the index case. If there is evidence or high likelihood for secondary transmission within the household, household members should be given chemoprophylaxis. Chemoprophylaxis in adults includes tetracycline (500 mg orally four

times a day) or doxycycline (a single 300 mg dose). In children, tetracycline (50/mg/kg/day orally in four divided doses) or doxycycline (6 mg/kg orally once a day) may be used for the short course regimen. Alternative prophylactic agents include furazolidone, trimethoprim and sulfonamide (TMP/SMX), or erythromycin.

3. Prevention

- 3.1. Provide purified water (boil or chlorinate) and sanitary disposal of feces.
- 3.2. Persons with diarrhea should not prepare food.
- 3.3. Provide adequate hand washing facilities.
- 3.4. Cook food, especially fish and shellfish, thoroughly. Refrigerate cooked food (especially grains) immediately.
- 3.5. Immunization: A killed whole cell vaccine is available, but of little value for epidemic control or management of contacts to cases. Two other oral vaccines are not currently licensed for use in the US.

Management of Cholera in Child Care Centers

Cases of cholera in child care centers are extremely unlikely in the US. In general, children who are not toilet trained and have diarrhea should be excluded from child care settings and evaluated appropriately.

References

American Academy of Pediatrics. In: Kimberlin, DW, *et al* eds. Red Book: 2018 Report of the Committee on Infectious Diseases. 31st ed. Itasca, IL: American Academy of Pediatrics; 2018.

CDC. NCID. <http://www.cdc.gov/cholera>

Heymann, DL, ed. Control of Communicable Diseases Manual. 19th edition. Washington, DC: American Public Health Association; 2008.

See Cholera Fact Sheets ([English](#)) ([Spanish](#))