Shigella Species

Background

Shigella species are Gram negative bacilli (rods) and are part of the Family *Enterobacteriaceae*. Other Family members include *Escherichia coli* (*E. coli*), Klebsiella species, Enterobacter species, Citrobacter species, and Salmonella species. There are 4 species of Shigella*: S. sonnei, S. flexneri, S. dysenteriae*, and *S. boydii*. *S. dysenteriae* is considered the most virulent. It can produce a potent cytotoxin known as Shiga-toxin.

Shigella bacteria will cause an infectious diarrheal illness referred to as Shigellosis. The bacteria is acid-tolerant, so only a few bacteria need to pass through the stomach to cause illness.

Transmission

Shigella bacteria spread through the direct or indirect fecal-oral route. The illness is highly infectious and can also be spread from person to person. Transmission typically occurs by:

- eating contaminated foods, which become infected when:
  - handled with poor hygiene
  - washed with water contaminated with feces
- drinking contaminated liquids, such as recreational water from rivers, lakes, and other coastal waters
- sexual oral-anal contact; outbreaks have occurred among men who have sex with men

The incubation period for shigellosis is 1 to 7 days.

Symptoms

Once ingested, Shigella causes watery diarrhea, usually occurring within 24 to 48 hours.

Illness can range from mild, watery diarrhea to a severe inflammatory infection referred to as dysentery.

Symptoms include:

- watery or bloody diarrhea, which may contain mucus
- severe abdominal cramps
- tenesmus (sensation of needing to use toilet, but nothing passes)
- fever and malaise
- nausea and vomiting

The illness usually lasts for 4 to 7 days. People are infectious while they are sick, and infectivity could last for up to 4 weeks after illness. Some people may not experience symptoms after they have been infected with *Shigella*. However, their feces may still be contagious for up to a few weeks.

Complications occasionally include:

- severe dehydration, which could lead to shock and death if not treated early
- seizures, especially in young children,
- bloodstream infections (sepsis), which are most common among patients with weakened immune systems, such as those with HIV, cancer, or severe malnutrition
- Hemolytic-uremic syndrome (HUS), which has been linked to Shiga toxin, a potent cytotoxin produced by *S*. *dysenteriae* that can also cause other neurotoxic effects
- toxic megacolon, a rare complication occurs when colon becomes paralyzed, preventing a bowel movement or passing gas
- Reiter's syndrome, which is:
    - associated with *S. flexneri*
    - also known as reactive arthritis or post-infectious arthritis
    - characterized by the classic triad of conjunctivitis, urethritis and arthritis

Treatment

Infections are usually self-limiting (assuming oral rehydration or electrolyte replacement). Infection can become life-threatening in seniors, children and those with weakened immune systems. In severe cases, patients may need to be given fluids intravenously.

Most patients recover without complications within 5 to 7 days without specific treatment.

Antibiotics are prescribed based on the severity of disease, the age of the patient and the likelihood of further transmission of the infection. Many strains of Shigella have developed resistance to multiple antibiotics. In this situation, laboratory tests are required to determine which antibiotics are likely to be effective. Extensively drug-resistant (XDR) Shigella is being monitored as an increasing number of resistant isolated have been noted over the past few years. (https://emergency.cdc.gov/han/2023/pdf/CDC_HAN_486.pdf)

Prevention

CDC and Health Canada do not recommend specific transmission-based precautions for Shigella in continent adults, however, when caring for children, or adults with uncontrolled diarrhea, use of the appropriate transmission-based precautions would be indicated.

Other measures to prevent transmission would include:

- Wash hands frequently and thoroughly
- Supervise small children when they wash their hands
- Dispose of soiled diapers properly
- Disinfect diaper-changing areas after use
- Don't prepare food for others if you have diarrhea
- Keep children with diarrhea home from child care, play groups or school
- Avoid swallowing water from ponds, lakes or untreated pools
- Avoid sexual activity with anyone who has diarrhea or who recently recovered from diarrhea

Disinfection

Diversey has several disinfectants effective against Shigella species.

These include:

Product	Oxivir®1 RTU / Wipes	Oxivir® Tb RTU / Wipes	Oxivir® Five 16	Alpha HP®	Avert™ Sporicidal Disinfectant Cleaner/Wipes	Virex® Plus	Virex® II 256	Virex® Tb	Expose® II 256	MoonBeam™3 UV Disinfection
Contact Time (Min)	1	1	5	5	1	1	10	3	10	< 1 min
										

Resources

Centers for Disease Control: https://www.cdc.gov/shigella/index.html

Health Canada: https://www.canada.ca/en/public-health/services/diseases/shigella.html

Reviewed/Revised March 1, 2023