

## 2.7 Giardiasis

### Etiology

*Giardia lamblia* (also known as *Giardia intestinalis*) is a flagellate protozoan that infects the biliary tract and upper small intestine. It exists in trophozoite (free living stage) and cyst forms. The cyst is the infective form and is sporadically excreted in feces. *Giardia* cysts survive well in the environment, particularly in cold water. If cysts are found in drinking water, boiling the water for a minimum of one minute may inactivate them.

### Case Definition

#### Confirmed Case

Laboratory confirmation of infection with or without symptoms from stool, duodenal fluid, or small bowel biopsy specimen:

- demonstration of *Giardia lamblia*

**OR**

- demonstration of *Giardia lamblia* antigen

#### Probable Case

Clinical illness<sup>5</sup> in a person who is epidemiologically linked to a confirmed case

### Clinical Presentation

Giardiasis is often asymptomatic. Symptomatic individuals may suffer a broad spectrum of manifestations including the acute onset of intermittent acute watery diarrhea, steatorrhea, abdominal cramps and distention, flatulence, and anorexia. Periods of diarrhea may alternate with constipation until the individual has been treated or the symptoms resolve spontaneously. Vomiting, fever, and tenesmus occur less commonly. One of the most distinguishing features of illness is the prolonged duration of diarrhea. As the disease progresses the stool becomes greasy, foul-smelling, and may float. The malabsorption of fats and fat soluble vitamins can occur with prolonged illness. Weight loss is common.

The infection is often self-limited lasting a few weeks to months. Most persons with giardiasis have a relatively benign course of infection; however some individuals, in particular children younger than five years of age and pregnant women, may have severe illness characterized by weight loss and require hospitalization.

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<sup>5</sup> Clinical illness is characterized by diarrhea, abdominal cramps, bloating, weight loss, fatigue or malabsorption.

## Diagnosis

Giardiasis should be considered in persons with prolonged diarrhea especially when associated with malabsorption or weight loss. The diagnosis is most often made by examination of stool for ova and parasites. For confirmation on laboratory specimens go to the public health laboratory web site [www.publichealthlab.ca](http://www.publichealthlab.ca) or call 709-777-6583.

## Epidemiology

### Occurrence

Giardiasis, sometimes called 'beaver fever', is the most common cause of endemic and epidemic diarrhea throughout the world. The causative organism is *Giardia intestinalis* (also known as *Giardia lamblia*). People who spend time in institutional or day-care environments are more susceptible, as are travelers and those who consume improperly treated water. The mean annual incidence reported in Canada from 2000 to 2004 was 14.6 per 100,000 population and for the same period the mean incidence rate in Newfoundland Labrador was 7.8 per 100,000. Twenty three cases of *Giardia* were reported in year 2015 in NL.

### Reservoir

Humans are the principal reservoir but *Giardia* organisms can infect beavers, dogs, cats, and other animals. These animals can contaminate water with feces containing cysts that are infectious for humans. People should be educated regarding drinking for untreated water such as roadside streams.

### Transmission

Giardiasis is passed via the fecal-oral route. People become infected directly by ingestion of cysts from the feces of an infected person or indirectly by ingestion of water or food contaminated with feces. Person-to-person transmission is common where personal hygiene may be poor. Children who are not toilet trained are often linked to day care and family outbreaks.

### Incubation Period

The incubation period is usually three to twenty five days; median 7-10 days.

### Communicability

The period of communicability extends through the course of the infection (as long as the person excretes the cysts).

## Control Measures

### Management of Case

#### *Investigations*

- Complete the appropriate food/waterborne illness questionnaire.
- Determine history of travel, wilderness hiking or camping and the use of untreated drinking water.

- Determine the possible source of infection taking into consideration the incubation period, reservoir, and mode of transmission. Assessment may include:
  - Determine history of high risk sexual practices especially contact with feces, and
  - Identifying attendance at daycare or other type of institutional contact (e.g., continuing care facility).
- Investigate for possible contamination of well or water supply.
- Identify history of residing in areas with poor sanitation including improper water treatment and sewage disposal and include recent immigration.
- Assess for similar symptoms in other members of the household (historical or present).

### ***Treatment***

- Symptomatic cases should be treated.
- Antibiotics are prescribed according to the physician.
- Treatment of asymptomatic carriers is generally not recommended.

### ***Exclusion***

Exclusion (staying away from school or work) should be considered for symptomatic and asymptomatic persons who are

- Food handlers whose work involves
  - touching unwrapped food to be consumed raw or without further cooking and/or
  - handling equipment or utensils that touch unwrapped food to be consumed raw or without further cooking,
- Healthcare, daycare or other staff who have contact through serving food with highly susceptible patients or persons, in whom an intestinal infection would have particularly serious consequences, involved in patient care or care of young children, elderly or dependent persons.
- Children attending child care or similar facilities who are diapered or unable to implement good standards of personal hygiene.
- Older children or adults who are unable to implement good standards of personal hygiene (e.g., mentally or physically challenged).
- Exclude symptomatic individuals from work or child care environments until asymptomatic for 48 hours.
- Reassignment to a low risk area may be used as an alternative to exclusion.

### ***Management of Contacts***

- Contacts should be instructed in disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Symptomatic contacts should be assessed by a physician.
- All identified infections should be treated at the same time as the case.
- Contacts who are symptomatic may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly or dependent persons as per MOH assessment.

- Two stool specimens or cultures may be requested from symptomatic contacts not less than 24 hours apart. Specimens must be reported as negative prior to returning to occupations involving food handling, child care, patient care or care of young, elderly or dependent persons.
- Asymptomatic contacts, in general, are not excluded from work or child care.

### **Management of Outbreaks**

An outbreak management team should be established to address infection prevention and control measures. If the outbreak is limited to one region the region is responsible to manage the outbreak; if more than one region is involved the outbreak will be managed by the province or in consultation with the province.

### **Education and Preventive Measures**

- Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food.
- Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, and thorough hand washing.
- Advise infected individuals to avoid food preparation.
- Educate about the risk of sexual practices that permit fecal-oral contact.
- Educate about condom use for safer sex.
- Test private water supplies for presence of contamination, if suspected.
- Advise individuals to avoid using public swimming pools when feces cannot be contained or when experiencing diarrhea. Water contained in public swimming areas can be a vehicle for the human to human transmission of enteric pathogens.
- Educate regarding good personal hygiene, especially hand washing for staff and children in institutions and daycares.
- Educate campers, backpackers, and others to avoid drinking water directly from streams. Water should be boiled for at least one minute before it is used for drinking, food preparation, and oral hygiene.
- Prevent water outbreaks by the combination of adequate filtration of water from surface water sources (e.g., lakes, rivers, streams), chlorination, and maintenance of water distribution systems.
- Provide a fact sheet available at:  
[http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/giardia\\_cryptosporidium-eng.php](http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/giardia_cryptosporidium-eng.php)

### **Reporting Requirements and Procedures**

- The laboratory (hospital or public health laboratories) report case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)

- The MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and infection control practitioners (ICP), in the particular region as required for follow-up and case investigation.
- EHO will conduct an investigation of the case under the direction of the MOH and provide case details as per the food history.
- CDCN enters the case details into the electronic reporting system and uses the CNPHI tool, if indicated, for alerts or outbreak summaries

### **Provincial Disease Control**

- Reports the aggregate case data to Public Health Agency of Canada
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website
- Coordinates the response if an outbreak across RHAs (CMOH will likely coordinate an outbreak across RHAs with input from disease control and environmental health.)

### **References**

Public Health Agency of Canada. *Infectious substances: Giardia lamblia*. Office of Laboratory Security. Material Safety Data Sheet. January 2001. Retrieved June 26, 2013, from <http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/giardia-lamblia-eng.php>