Giardiasis

Summary

Giardiasis is a parasitic intestinal disease that may result in asymptomatic infection; acute, self-limited diarrhea; or chronic intermittent symptoms. The disease is spread primarily person to person or through ingestion of contaminated water. A typical case of giardiasis presents with frequent loose stools with mucous but no blood, dull epigastric pain, and flatulence. Some individuals experience chronic intermittent diarrhea, weight loss, bloating, or stomach cramps. Infection is diagnosed by direct examination of stool or by stool antigen detection. There are several antiparasitic agents available to treat giardiasis. Control measures include good hand hygiene practices and avoiding drinking of untreated surface water.

Agent

Giardia intestinalis (also known as *G. lamblia* and *G. duodenalis*) is a flagellated protozoan parasite.

Transmission

Reservoir:

This enteric parasite affects humans and a range of domestic and wild animals (e.g., cats, dogs, cattle, deer and beavers). However, the role of animals as reservoirs is unclear.

Transmission:

Direct person-to-person (fecal-oral) transmission is probably the principal mode of spread. This may occur when cysts in feces of an infected person are passed hand to mouth to an uninfected person. This is probably the most common mode of spread among children, especially for toddlers in diapers. The prevalence of infection is highest in areas of poor sanitation and in institutions (including child care centers). Fecal-oral transmission also occurs from the ingestion of *Giardia* cysts through the consumption of fecally contaminated food or water; this accounts for many cases reported in campers and hikers who drink untreated water. Community-wide outbreaks have occurred when municipal systems have become contaminated or when filtration systems have been bypassed or broken.

Period of Communicability:

The period of communicability is as long as the organism is excreted in stool. The infectious dose is small; ingestion of 10 cysts has been reported to cause infection. Infected persons have been reported to shed 1-10 billion cysts in their stool daily and this might last for several months. Symptomatic giardiasis in adults usually lasts from 2 weeks to 2 months; however, chronic giardiasis, usually only found among those who are immunocompromised, may persist for many months to years. Asymptomatic carriage and shedding of *Giardia* may persist for months.

Clinical Disease

Incubation period:

Usually 3-25 days.

Illness:

Asymptomatic infection is common (in approximately 60%), and may occur more frequently in children or in people with prior infections. Symptomatic patients have diarrhea with loose, foul-smelling stools. Blood is not present in stools. A more protracted diarrheal illness can occur with symptoms of flatulence, abdominal distention, cramps, fatigue, and anorexia. There can be significant weight loss and malabsorption. Symptoms can persist for several weeks.

Laboratory Diagnosis

Laboratory confirmed giardiasis is defined as the detection (in symptomatic or asymptomatic persons) of *Giardia intestinalis* cysts in stool specimens or trophozoites in stool specimens, duodenal fluid, or small-bowel tissue by microscopic examination using staining methods (e.g., trichrome) or direct fluorescent antibody (DFA) assays; or antigens in stool specimens by immunodiagnostic testing (e.g., enzyme-linked immunosorbent assay). Tests using enzyme immunoassay (EIA) or immunoflourescent antibody (IFA) methods for detection of *Giardia* antigen in the stool (or duodenal fluid) are commercially available and are generally more sensitive than direct microscopy.

Because excretion of the cysts can be sporadic, the sensitivity of stool examination can be improved by repeat testing (generally up to three stool samples). To enhance detection, stool exam should be done shortly after collection, or stool should be placed in a fixative. SLD no longer provides transport media for ova and parasite (O and P) exams nor does it do any stool testing for *Giardia*.

Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnoses. CIDT is a PCR test with approximately 1-hour turnaround time, which makes it appealing, however, the PCR is run as a GI panel and often results in detection of several conditions at the same time. Investigations are needed to confirm all results.

Treatment

All treatment decisions should be made in consultation with the patient's health care provider.

- Metronidazole, tinidazole or nitromidazole are the drugs of choice. Cure rates range from 80 to 100% depending on the drug used.
- If therapy fails, a course can be repeated with the same drug. Relapse is common in immunocompromised patients who may require prolonged treatment. Treatment of asymptomatic carriers is generally not recommended but could be considered for carriers in households of patients with hypogammaglobulinemia or cystic fibrosis.

Surveillance

Case Definition:

Laboratory criteria - Demonstration of *G. intestinalis* cysts in stool; or demonstration of *G. intestinalis* trophozoites in stool, duodenal fluid, or small-bowel biopsy; or demonstration of *G. intestinalis* antigen in stool by a specific immunodiagnostic test.

Confirmed – A case that is laboratory confirmed and meets the clinical description.

Probable – A clinically compatible case that is epidemiologically linked to a confirmed case.

Reporting:

Report all suspected, probable, or confirmed cases of giardiasis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's

name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Use the Foodborne Surveillance Investigation Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

Control Measures

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: Vibrio> STEC> Cryptosporidium> Salmonella> Shigella> Campylobacter> Cyclospora> Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. Case management

1.1. Isolation:

1.1.a Exclude **symptomatic** persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Persons may be allowed to resume usual duties when:

- Diarrhea has resolved, and
- Proper hygiene measures can be maintained (as assessed by a food sanitarian, trained environmentalist, or infection control practitioner). In the instance of a food handler, contact the Environment Department's district food program and in the case of a health care worker, contact the facility's infection preventionist to assess the risk for transmission.

1.1.b Exclusion of **asymptomatic** infected persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients may be indicated if their food handling or personal hygiene habits (as assessed by a food sanitarian, trained environmentalist, or infection preventionist) are inadequate to prevent transmission of enteric infection to patrons or patients. They need not be excluded from work if proper hygiene measures are maintained.

1.1.c For hospitalized or institutionalized patients, *Giardia* requires standard precautions but for diapered or incontinent patients including children less than 6 years of age, *Giardia* requires the additional use of contact precautions.

1.2. Prophylaxis: Not applicable.

2. Contact management

Isolation: Household or other close contacts should have their stool examined for *Giardia* if they are symptomatic. Because of intermittent shedding, three negative specimens taken at least 24 hours apart should be obtained to rule out infection. Exclude symptomatic contacts from food handling.

2.1. Prophylaxis: Not applicable.

3. Prevention

3.1. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

3.2. Backpackers, campers, and other persons at risk for exposure to contaminated water should avoid drinking water directly from surface water sources (e.g., lakes, rivers, streams). Boiling of water for at least one minute will kill the infective cysts.

3.3. Prevent contact and contamination with feces during sex by using a barrier (e.g., condom) during oral-anal sex and washing hands immediately after either handling a condom used during anal sex or after touching the anus or rectal area.

3.4. To prevent the contamination of recreational waters, do not swim when ill with diarrhea.

3.5. Immunization: Not applicable.

Management of Giardia in Child Care Centers

1. Persons with diarrhea should be excluded from child care until they are asymptomatic.
2. Per child care licensing regulations, a center should notify parents or guardians in writing of a case of *Giardia* in the facility. See Appendix 7 for a template of a notification letter.
3. If an outbreak is suspected, contact ERD at 505-827-0006. An investigation will be undertaken to identify and treat all symptomatic children, child care staff, and family members infected with *Giardia*. Exclusion of asymptomatic carriers from child care is not recommended.
4. The child care center should review its infection control protocols with staff, and emphasize the following:
    - Standard precautions should be followed. Strict hand washing routines for staff and children, and routines for handling fecally contaminated materials.
    - Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, and then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).
    - Food-handling and diaper changing areas should be physically separated and cleaned daily.
    - Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, nonporous gloves should be worn when changing diapers.
    - Ideally, institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation, but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

- Animals in the child care center with diarrhea should be isolated from children and taken to a veterinarian for diagnosis and treatment.

References

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See Giardiasis Fact Sheets (English) (Spanish).