Giardiasis

Investigative Guidelines

March 2018

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To provide data on the temporal, demographic and geographical distribution of illness to identify sources of major public health concern (for example, a public water supply or a day care facility) to stop transmission from such a source, and prevent future recurrences.
2. To identify whether the case may be a source of infection for other persons (for example, a diapered child or a day care attendee), and if so to prevent future transmission.

1.2 Laboratory and Physician Reporting Requirements

Laboratories, physicians and others providing health care must report confirmed or suspected cases to the Local Health Department (LHD) within one working day of the calendar week.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive (but not suspect) cases (see definitions below) to the Oregon Public Health Division (PHD) by the end of the calendar week.
2. Additional case investigation is optional, (though is appreciated), unless the case is ≤3 years of age and attends day care, or there is an increase in the number of cases reported suggesting an outbreak may be occurring. Under these circumstances, begin active case investigation within one working day. Interview the case(s) or a proxy to identify potential sources of exposure and identify any close contacts with gastrointestinal illness. Notify the Acute and Communicable Disease Prevention (ACDP) Section of the Oregon Health Authority (OHA) by phone at 971-673-1111 if an outbreak is suspected.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Giardia lamblia (AKA *G. intestinalis, G. duodenalis*) is a protozoan parasite. It is the most common intestinal parasitic infection reported in the U.S. This flagellated protozoan has two life cycle stages: cyst and trophozoite. The infectious form is the relatively hardy cyst, which can remain viable in the environment for weeks or even months. After ingestion, cysts develop in the

upper small intestine into trophozoites, which are the motile, feeding, reproducing, symptom-causing form of the parasite. Infected persons shed trophozoites or cysts (or both) in stool. Persons with profuse diarrhea tend to shed mostly trophozoites, which are not infectious. Many, if not most, infected persons are asymptomatic, but these are, by and large, the ones shedding the infectious cysts. Illness is generally self-limited.

2.2 Description of Illness

Symptoms are variable, but typically include sudden onset, watery, foul-smelling diarrhea that may persist for weeks, is often intermittent, and accompanied by abdominal cramps and a “bloated” feeling, with excess gas. Diarrhea is not always present: nausea, bloating and abdominal pain may be the extent of the symptoms. Weight loss is not uncommon. Because fat absorption is impaired, stools may have a higher than usual fat content (steatorrhea) and thus tend to float. Many infections are asymptomatic. The nature of acquired immunity (if any) is uncertain. Some people with regular exposure may develop some degree of resistance to illness.

2.3 Reservoirs

Animals and some humans are host for this parasite. Overall, humans are certainly the most important source of other human infections. Many animals other than man have been found to be infected, although the importance of most non-human reservoirs is hotly debated. Deer, elk, beaver, and other wildlife may be important in contaminating surface water supplies; domestic animals (e.g., dogs) may be a source for some human exposures. Molecular studies have identified few cross-species assemblages, suggesting that zoonotic transmission is not as high as was once thought.[1]

2.4 Modes of Transmission

Transmission is fecal-oral. Examples include:

1. Contact with infected persons (e.g., asymptomatic children shedding cysts);
2. Drinking fecally contaminated and inadequately treated water;
3. Ingestion of fecally contaminated recreational water (rivers, lakes, etc.);
4. Eating food contaminated by animals or food handlers (rarely documented).

2.5 Incubation Period

Variable, in the 3- to 15-day range; median 7–10 days.

2.6 Period of Communicability

Persons are infectious as long as cysts are being shed, which may be days to years; the typical period is poorly defined and, moreover, may be intermittent. To reiterate, asymptomatically infected persons tend to be much more infectious than persons with diarrhea.

2.7 Treatment

Giardia is generally a self-limiting illness. Several drugs are effective against *Giardia* infection. Nitroimidazole, Metronidazole (Flagyl®) or Nitazoxanide are considered the most effective treatment; furazolidone (Furoxone®) may be considered for kids because it is available in liquid form; and paromomycin is not absorbed so it is useful for treatment of pregnant women, though, unless medical judgment indicates otherwise, waiting until after delivery is preferable. Other options include: Nitazoxanide (Alinia), Quinacrine hydrochloride (Atabrine®), tinidazole, or albendazole is another option. Quinacrine is indicated as a primary agent for patients with metronidazole-resistant giardiasis and patients who should not receive or cannot tolerate metronidazole. Giardiasis that is very resistant may even require a combination of quinacrine and metronidazole.

Treatment failure is not uncommon (~10% of the time), but is not thought to indicate resistance per se. A report course of the same or a different medication may be indicated.

3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

3.1 Confirmed Case Definition

A case with gastrointestinal symptoms such as diarrhea, abdominal cramps, bloating or weight loss or malabsorption AND identification of *Giardia* in feces or intestinal fluid, tissue samples, biopsy specimens, or a positive *Giardia*-specific antigen test or PCR. If clinical information is not collected and symptoms are not ruled out, it will be assumed that cases were symptomatic for classification purposes.

3.2 Presumptive Case Definitions

Diarrheal illness lasting >5 days in someone epidemiologically linked to a confirmed case.

3.3 Suspect Case (*not* reportable to Oregon PHD)

Anyone with undiagnosed diarrheal illness lasting <5 days.

3.4 Services Available at the Oregon State Public Health Laboratories

OSPHL does not perform ova and parasite testing to identify *Giardia*. This testing is available in private sector reference laboratories.

4. ROUTINE CASE INVESTIGATION

Routine case investigation should include the completion of case demographics, laboratory and clinical data. Further investigation is not required unless:

1. The case is ≤3 years old and attends day care where there are diapered children;
   or

2. The number of recent reports (or other evidence) suggests that an outbreak might be occurring.

Should either circumstance occur refer to §6, Managing Special Situations

5. CONTROLLING FURTHER SPREAD

5.1 Education

1. Provide basic instruction in fecal-oral modes of transmission, environmental disinfection, and personal hygiene, emphasizing proper hand-washing techniques.
2. As relevant, discuss the risks of drinking unfiltered or untreated surface water, including private water supplies or water from streams or lakes while camping or hiking. Generally, persons should be educated about the risks of both giardiasis and cryptosporidiosis. Although some chemical disinfectants are effective against *Giardia*, most are ineffective against *Cryptosporidium*. Bringing water to full, rolling boil is sufficient to kill both parasites. Many backpacking-type filers are also available that remove Giardia cysts and the smaller *Cryptosporidium* oocysts. Absolute <1 micron filters (NSF standard 53 or 58) rated are recommended for crypt reduction and removal. Filters must be properly maintained.
3. Do not enter public recreational water venues (pools, fountains, lakes) until 2 weeks after resolution of diarrhea.

5.2 Isolation and Work or Day Care Restrictions

Standard precautions (hand washing) are adequate to minimize the risk of further transmission.

1. As of March 2002, restrictions are no longer imposed routinely on persons with Giardiasis who attend or work at schools, child-care centers, health-care facilities, or as food handlers, unless they have diarrhea. Anyone who has illness of unknown etiology accompanied by diarrhea or vomiting should be excluded until cause is determined and appropriate therapy, as indicated, is initiated. (See OAR 333-019-0010 for more information of those diarrheal diseases for which restriction still applies).
2. Apparent ongoing disease transmission (identification of epi-linked cases) requires consideration of additional intervention. See also, §6, Managing Special Situations.

5.3 Case Follow-up

Generally, not indicated.

5.4 Protection of Contacts

Not applicable.

5.5 Environmental Measures

As indicated, e.g., day-care inspections, education on disinfecting surfaces, evaluation of drinking water supplies, etc. Remind day-care staff to keep cleaning products safely out of their clients' reach, preferably in a locked cupboard, but not where they will be forgotten and not used.

6. MANAGING SPECIAL SITUATIONS

6.1 Case is ≤3 Years Old AND Attends a Daycare Facility

1. Instruct the operator and staff about proper food handling, hand-washing after diaper handling or poop clean-up. Commercial products that meet the Environmental Protection Agency's (EPA) standards for "hospital-grade" germicides may be used for cleaning surfaces. A cheap disinfectant for use in bathrooms and diapering areas is 1 tablespoon of household bleach to 1 quart of water. This solution of bleach and water is easy to mix, and is safe if handled properly. Like other household disinfectants, it can be irritating to the skin, eyes, nose, and mouth if used from a spray bottle. Because bleach and water is weakened by organic material, evaporation, heat, and sunlight, solutions should be dated when mixed and replaced every few days.
2. If other suspect cases are identified, request testing of children who share the same classroom, play area, diapering area, or have other contact with the confirmed case(s): 3 specimens collected on different days is best. The need to check asymptomatic children should be determined by the circumstances of the outbreak investigation in consultation with ACDP epidemiologists.
3. Treatment of asymptomatic children, even in the setting of a day-care outbreak, is not recommended. It may lower prevalence in the short term, but it doesn't help in the long term, and exposes these children to potentially toxic antimicrobials. That said, should an outbreak rage on despite the above measures, wider-testing of attendees and adult care-givers and treatment of all identified infected may be warranted.
4. Look for possible cases among family members of infected children. Stool exams are indicated for symptomatic household members or other symptomatic children who attend day care.
5. The day-care operator should be instructed to call the LHD immediately if new cases of diarrhea occur. The facility should be called or visited once each week for six weeks after onset of the last case to verify that surveillance and appropriate preventive measures are being carried out. Newly symptomatic children should be managed as outlined above.

6.2 Reported Incidence is Significantly Higher than Usual

If the number of reported cases in your county is higher than usual for the time of year, or for a particular age group, sex, race, ethnicity, etc., (you know all that epi stuff — time, person, place), conduct routine follow-up investigations for all cases reported, working back to include all cases reported at least 2 weeks

before the apparent upswing. Interview cases and others who may be able to provide pertinent information.

Ask about possible exposures in the 4 to 25 days before onset, including:

1. Name, diagnosis, and phone number or address of any acquaintance or household member with a similar illness (N.B.– anyone meeting the presumptive case definition should be reported and investigated in the same manner as a confirmed case);
2. Attendance or work at a day care facility by the case or household member of the case;
3. Source(s) of drinking water, including water at home and work, as well as streams, lakes, or other untreated sources;
4. Recreational water exposures, lakes, rivers, swimming pools, water slides.
5. Travel outside the area.

Talk to the epidemiologists at ACDP. Your heads-up on an increase in cases will at least get you sympathy, if not useful suggestions on what to do next.

6.3 Common Source Outbreak Suspected

Consult with ACDP epidemiologists as soon as you suspect an outbreak.

REFERENCES

1. Xiao L, Fayer R. Molecular characterization of species and genotypes of *Cryptosporidium* and *Giardia* and assessment of zoonotic transmission. Int J Parasitol 2008;38:1239–55.CDC information: *http://www.cdc.gov/parasites/crypto/index.html*

2. Painter JE, Gargano JW, Collier SA, Yoder JS. Giardiasis Surveillance — United States, 2011–2012. MMWR 2015:64(SS-3):15–25.

UPDATE LOG

March 2018 – Updated services provided by OSPHL. They no longer test for *Giardia* ova and parasites. Update information in filtration recommendations. (June Bancroft)

November 2015 – Added PCR as a test type for confirmation. Updated symptoms and treatment options. Put into new template (June Bancroft)

May 2012 – These revisions include: Case definitions were modified to be in line with CSTE national notifiable disease case definitions. These new guidelines call for clinical signs and symptoms to be present to meet the case definition. If resources permit, interview all cases or collect at least demographic, clinical and laboratory data to decide whether the case meets the definition of a confirmed or presumptive case. If clinical information is not collected, and symptoms are not ruled out, it will be assumed that cases were symptomatic for classification purposes. (June Bancroft)