

IN THIS ISSUE: GIARDIASIS AND CRYPTOSPORIDIOSIS

Waterborne Diseases: Giardiasis and Cryptosporidiosis

Introduction

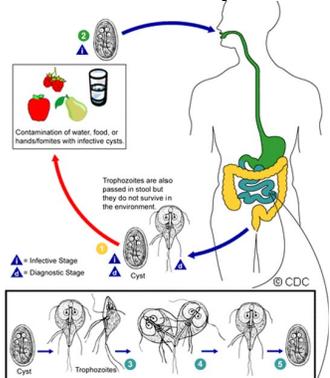
Waterborne diseases are illnesses acquired via exposure to water contaminated with pathogens. These types of diseases often result in gastrointestinal symptoms.¹ The water source could be from drinking water, lakes, rivers, and recreational sources of water.¹ The Centers for Disease Control and Prevention (CDC) estimates 1 out of 44 people will acquire a waterborne disease in the United States (U.S.) each year.² In 2014, approximately 7.15 million cases of waterborne disease and 6,630 deaths were estimated to have occurred in the U.S.²

Although a variety of pathogens (bacteria, viruses, and parasites) can be transmitted through water, this issue will focus on giardiasis and cryptosporidiosis, which are listed in CDC's top 5 domestically acquired waterborne illnesses.²

Etiology

Giardiasis and cryptosporidiosis are intestinal illnesses caused by aquatic protozoans.³ Giardiasis is caused by *Giardia duodenalis*, while 90% of cryptosporidiosis cases are attributed to *Cryptosporidium parvum* or *Cryptosporidium hominis*.^{4,5}

Figure 1: *Giardia duodenalis* life cycle



Source: https://publications.aap.org/view-large/figure/11494109/046_06.jpeg

These parasites share a similar life cycle that requires the ingestion of food or water contaminated with a cyst (*Giardia*) or oocyst (*Cryptosporidium*).^{4,5} Once in the host, the organism will grow and infect the digestive system and produce (oo)cyst that are then shed in the feces.^{4,5} Humans and various animals

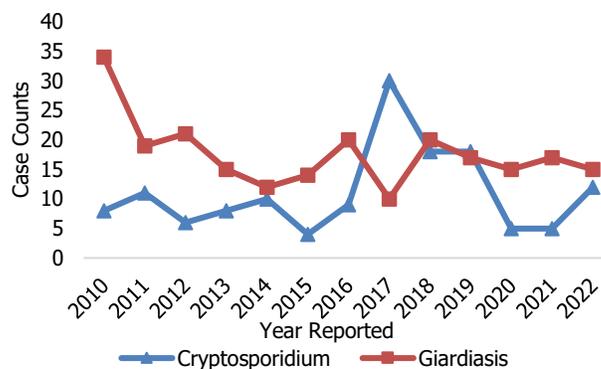
(wild and domestic) are reservoirs for *Giardia* and *Cryptosporidium*.⁴

Epidemiology

The U.S. incidence of *Giardia* and *Cryptosporidium* are highest among children 1-9 years of age; however, the 25-29 year and 55-59 age groups also have higher incidence of *Giardia*.⁵ Cases peak between early summer and fall when outdoor, travel, and recreational water activities increase.⁵ The majority of *Giardia* and *Cryptosporidium* outbreaks have been linked to drinking water and recreational water exposure.⁵ *Giardia* outbreaks in childcare facilities have also been reported.⁵

Nationally, between 2010 and 2019, the incidence of *Cryptosporidium* increased by 47.2%, while *Giardia* remained relatively stable during this time frame.^{6,7} Locally, Washoe County Health District (WCHD) reported an increase in Cryptosporidiosis cases between 2010-2019; however, cases decreased the following years (2020-2022).⁸ Giardiasis declined between 2010 and 2011, but remained stable since 2011. [Fig. 2]⁸

Figure 2: Cryptosporidiosis and giardiasis case counts, 2010-2022, Washoe County, Nevada



Source: <https://www.washoecounty.gov/health/files/ephp/communicable-diseases/weekly/washoecounty.html>

Risk Factors & Prevention

Anyone can catch cryptosporidiosis and giardiasis. In order to prevent catching these parasitic diseases, the following activities should be avoided:^{4,5}

- Drinking contaminated water (pools, rivers, lakes, or stream) or unpasteurized apple cider and milk
- Contact with infected pets and livestock
- Travel to endemic areas
- Close or sexual contact to infected persons

The group most likely to experience severe and lingering infections are persons with human immunodeficiency virus (HIV).⁴ Persons living with HIV may have difficulty clearing parasitic infections.⁴

Signs & Symptoms

Giardia

Most giardiasis cases are asymptomatic.^{4,5} If symptoms do present, it can take 1 to 3 weeks to show and can last anywhere from 2 to 4 weeks.^{4,5} Chronic infections may develop and can last for years in immunocompromised individuals.^{4,5} Symptoms associated with giardiasis include:^{4,5}

- Diarrhea
- Abdominal cramping
- Bloating
- Strong smelling stools and flatulence
- Weight loss
- Greasy stools

Cryptosporidium

Once exposed to *Cryptosporidium*, symptoms may present within 2 to 10 days.^{4,5} Like *Giardia*, some cases may be asymptomatic as well. Symptoms may subside and then return throughout the course of illness, but usually resolve within 30 days.^{4,5} Those infected with cryptosporidiosis could experience the following:^{4,5}

- Watery diarrhea
- Abdominal cramping
- Fatigue
- Weight loss
- Vomiting
- Anorexia

Diagnosis & Testing

Cryptosporidium and *Giardia* are diagnosed through stool testing.⁵ Direct fluorescence antibody is considered the gold standard for diagnosis of both parasites.⁵ Tests such as enzyme immunoassay kits and immunochromatographic tests are appropriate alternatives to use.⁵ Identifying *Cryptosporidium* and *Giardia* may be difficult and may require multiple sample submissions.^{5,9} Ova and parasites tests may not detect *Cryptosporidium* species and may need to be requested.⁵

Treatment

Not all healthy patients may need treatment as symptoms may resolve; however, treatment may shorten excretion of oo(cyst).⁵ If indicated, tinidazole, metronidazole, and nitazoxanide are recommended for giardiasis.⁵ For patients with cryptosporidiosis, nitazoxanide is the endorsed therapy.⁵ Persons with HIV can receive antiretroviral therapy in addition to antiparasitic medication for treatment.⁵

Reporting

The list of reportable communicable diseases and reporting forms can be found at:

<http://tinyurl.com/WashoeDiseaseReporting>

Report communicable diseases to the Washoe County Health District. To report a communicable disease, please call 775-328-2447 or fax your report to the WCHD at 775-328-3764.

Acknowledgement

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