Appendix C

GUIDANCE FOR PEOPLE WITH SEVERELY WEAKENED IMMUNE SYSTEMS

INTRODUCTION

Cryptosporidium is a parasite commonly found in lakes and rivers, especially when the water is contaminated with sewage and animal wastes. Cryptosporidium is very resistant to disinfection, and even a well-operated water treatment system cannot ensure that drinking water will be completely free of this parasite. Current EPA drinking water standards were not explicitly designed to assure the removal or killing of Cryptosporidium. Efforts are now underway to resolve a number of scientific uncertainties that will enable EPA to set specific safety standards for this parasite in the future.

Cryptosporidium has recently caused several large waterborne disease outbreaks of gastrointestinal illness, with symptoms that include diarrhea, nausea, and/or stomach cramps. People with severely weakened immune systems (that is, severely immunocompromised) are likely to have more severe and more persistent symptoms than healthy individuals. Moreover, Cryptosporidium has been a contributing cause of death in some immunocompromised people. Individuals who are severely immunocompromised may include those who are infected with HIV/AIDS, cancer and transplant patients taking immunosuppressive drugs, and people born with a weakened immune system.

BACKGROUND

Data are not adequate to determine how most people become infected. For example, we do not know the importance of drinking water compared to other possible sources of Cryptosporidium, such as exposure to the feces of infected persons or animals, sex involving contact with feces, eating contaminated food, or accidentally swallowing contaminated recreational water.

Thus, in the absence of an outbreak, there are insufficient data to determine whether a severely immunocompromised individual is at a noticeably greater risk than the general public from waterborne Cryptosporidiosis. Even a low level of Cryptosporidium in water, however, may be of concern for the severelyimmunocompromised, because the illness can be life-threatening. The risk of a severely immunocompromised individual acquiring Cryptosporidiosis from drinking water in the absence of an outbreak is likely to vary from city to city, depending on the quality of the city's water source and the quality of water treatment. Current risk data are not adequate to support a recommendation that severely immunocompromised persons in all U.S. cities boil or avoid drinking tap water.

In the absence of a recognized outbreak, this guidance has been developed for severely immunocompromised people who may wish to take extra precautions to minimize their risk of infection from waterborne Cryptosporidiosis. To be effective, the guidance must be

followed consistently for all water used for drinking or for mixing beverages. During outbreaks of waterborne Cryptosporidiosis, studies have found that people who used precautions only part of the time were just as likely to become ill as people who did not use them at all.

GUIDANCE

EPA and CDC have developed the following guidance for severely immunocompromised people who may wish to take extra precautions. Such individuals should consult with their health care provider about what measures would be most appropriate and effective for reducing their overall risk of Cryptosporidium and other types of infection.

Although data are not sufficient for EPA/CDC to recommend that all severely immunocompromised persons take extra caution with regards to their drinking water, individuals who wish to take extra measures to avoid waterborne Cryptosporidiosis can bring their drinking water to a roiling boil for one minute. Boiling water is the most effective way of killing Cryptosporidium.

As an alternative to boiling water, people may use the following measures:

A point-of-use (personal use, end-of-tap, under-sink) filter. Only point-of-use filters that remove particles one micrometer or less in diameter should be considered. Filters in this category that provide the greatest assurance of Cryptosporidium removal include those that use reverse osmosis, those labeled as "Absolute" one micrometer filters, or those labeled as certified by NSF International (National Sanitation Foundation) under standard 53 for "Cyst Removal." The "Nominal" one micrometer rating is not standardized and many filters in this category may not reliably remove Cryptosporidium. As with all filters, people should follow the manufacturer's instructions for filter use and replacement. Water treated with a point-of-use filter that meets the above criteria may not necessarily be free of organisms smaller than Cryptosporidium that could pose a health hazard for severely immunocompromised individuals.

Bottled water. Many, but not all, brands of bottled water may provide a reasonable alternative to boiling tap water. The origin of the source water, the types of microorganisms in that water, and the treatment of that water before it is bottled vary considerably among bottled water companies and even among brands of water produced by the same company. Therefore, individuals should not presume that all bottled waters are absolutely free of Cryptosporidium. Bottled waters derived from protected well and protected spring water sources are less likely to be contaminated by Cryptosporidium than bottled waters containing municipal drinking water derived from less protected sources such as rivers and lakes. Any bottled water treated by distillation or reverse osmosis before bottling assures Cryptosporidium removal. Water passed through a commercial filter that meets the above criteria for a point-of-use device before bottling will provide nearly the same

level of Cryptosporidium removal as distillation or reverse osmosis. Bottled waters meeting the above criteria may not necessarily be free of organisms other than Cryptosporidium that could pose a health hazard for severely immunocompromised individuals.

Neither EPA nor CDC maintains a list of point-of-use filters or bottled water brands that meet the above criteria. NSF International can provide a list of filters that meet the NSF criteria. The NSF address is 3475 Plymouth Road, PO Box 130140, Ann Arbor, Michigan 48113-0140; phone number (800) NSF-8010 (http://www.nsf.org). Individuals who contact bottlers or filter manufacturers for information should request data supporting claims that a brand of bottled water or filter can meet the above criteria.

FURTHER INFORMATION

When an outbreak of waterborne Cryptosporidiosis is recognized and is determined to be on-going, officials of the public-health department and/or the water utility will normally issue a "boil water" notice to protect both the general public and the immunocompromised.

Current testing methods cannot determine with certainty whether Cryptosporidium detected in drinking water is alive or whether it can infect humans. In addition, the current method often requires several days to get results, by which time the tested water has already been used by the public and is no longer in the community's water pipes.

Severely immunocompromised people may face a variety of health risks. Depending on their illness and circumstances, a response by such individuals that focuses too specifically on one health risk may decrease the amount of attention that should be given to other risks. Health care providers can assist severely immunocompromised persons in weighing these risks and in applying this guidance.

FOR MORE INFORMATION ON CRYPTOSPORIDIUM:

The National Center for Disease Control and Prevention (CDC) has prepared a fact sheet on Cryptosporidium-www.cdc.gov/ncidod/publications/brochures/cryptos.htm

The National Center for Disease Control and Prevention (CDC) has prepared guidance for persons with HIV/AIDS who are concerned about Cryptosporidiosis-www.cdc.gov/ncidod/diseases/crypto/hivaids.htm

The US Department of Agriculture, in conjunction with Cornell University, has prepared a general information document on Cryptosporidium-www.inform.umd.edu/EdRes/Topic/AgrEnv/Water/cornell.html

Taken from EPA Office of Ground Water and Drinking Water Webpage
{www.epa.gov/ogwdw}

Frequently Asked Questions on Cryptosporidium

Q: What is Cryptosporidium and does my water system test for it?

A: Cryptosporidium is a parasite commonly found in lakes and rivers. It enters water supplies through sewage and animal waste. It causes cryptosporidiosis, a gastrointestinal disease. The largest water systems in the country are currently participating in a testing program in which they check their source water for Cryptosporidium each month for 18 months.

Q: What are the symptoms of cryptosporidiosis?

A: The most common symptom of cryptosporidiosis is watery, non-bloody diarrhea lasting 7-20 days. The diarrhea is often accompanied by abdominal cramping, nausea, vomiting, fever, headache, and/or loss of appetite. These symptoms are not specific to cryptosporidiosis and may be symptoms of other diseases. Generally, the disease is mild and people recover within one to three weeks. However, the disease can be severe, chronic, and even fatal for people with severely weakened immune systems, such as those with HIV/AIDS and cancer and transplant patients taking immunosuppressive drugs. If you have a severely weakened immune system, or your water system or local health authority has given you notice that a water treatment problem exists, then you may wish to boil your water vigorously for one minute before using it. Alternatively, you may wish to purchase bottled water or use a home treatment unit that is designed to remove Cryptosporidium.

US Environmental Protection Agency (EPA) and Centers for Disease Control and Prevention (CDC)

Centers for Disease Control and Prevention
National Center for Infectious Diseases
Division of Parasitic Diseases
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Cryptosporidiosis (Fact Sheet)

What is cryptosporidiosis?

Cryptosporidiosis is a disease caused by the parasite Cryptosporidium parvum, which as late as 1976 was not known to cause disease in humans. Until 1993, when over 400,000 people in Milwaukee, Wisconsin, became ill with diarrhea after drinking water contaminated with the parasite, few people had heard of either cryptosporidiosis or the single-celled intestinal protozoon that causes it.

Since the Milwaukee outbreak, concern about the safety of drinking water in the United States has increased, and new attention has been focused on determining and reducing the risk for cryptosporidiosis from community and municipal water supplies.

How is cryptosporidiosis spread?

Cryptosporidiosis is spread by putting something in the mouth that has been contaminated with the stool of an infected person or animal. In this way, people swallow the Cryptosporidium parasite, which is too small to be seen with the naked eye. A person can become infected by drinking contaminated water or eating raw or undercooked food contaminated with Cryptosporidium oocysts (an egg-like form of the parasite that is the infectious stage); direct contact with the droppings of infected animals or stool of infected humans; or hand-to-mouth transfer of oocysts from surfaces that may have become contaminated with microscopic amounts of stool from an infected person or animal.

What are the symptoms of cryptosporidiosis?

Two to ten days after infection by the parasite, symptoms may appear. Although some persons may not have symptoms, others have watery diarrhea, headache, abdominal cramps, nausea, vomiting, and low-grade fever. These symptoms may lead to weight loss and dehydration.

In otherwise healthy persons, these symptoms usually last 1 to 2 weeks, at which time the immune system is able to stop the infection. In persons with suppressed immune systems, such as persons who have AIDS or recently have had an organ or bone marrow transplant, the infection may continue and become life-threatening.

What should you do if you suspect that you have cryptosporidiosis?

See your physician. Since the routine stool examination used for most parasites usually fails to detect Cryptosporidium, a stool specimen should be examined using stains/tests available especially for this parasite. It is important for persons with a poorly functioning immune system to seek medical attention early in the course of their disease.

What is the treatment for cryptosporidiosis?

No safe and effective cure is available for cryptosporidiosis. People who have normal immune systems improve without taking antibiotic or antiparasitic medications. The treatment recommended for this diarrheal illness is to drink plenty of fluids and to get extra rest. Physicians may prescribe medication to slow the diarrhea during recovery.

Who is at risk?

Persons at increased risk for cryptosporidiosis include child care workers; diaper-aged children who attend child care centers; persons exposed to human feces by sexual contact; and caregivers who might come in direct contact with feces while caring for a person infected with cryptosporidiosis at home or in a medical facility. Once infected, persons with suppressed immune systems, such as cancer chemotherapy patients, are at risk for severe disease.

How can you prevent cryptosporidiosis?

Avoid water or food that may be contaminated.
Wash hands after using the toilet and before handling food.
If you work in a child care center where you change diapers, be sure to wash your hands thoroughly with plenty of soap and warm water after every diaper change, even if you wear gloves.
During communitywide outbreaks caused by contaminated drinking water, boil drinking water for 1 minute to kill the Cryptosporidium parasite. Allow water tocool before drinking it.

HIV-infected persons should avoid drinking water directly from lakes or rivers; avoid unpasteurized milk or milk products; avoid exposure to calves and lambs and places where these animals are raised; wash hands after contact with pets; and wash hands after gardening or other contact with soil. Because any sexual activity that brings a person in contact with the feces of an infected partner greatly increases the risk for cryptosporidiosis, HIV-infected persons and AIDS patients should follow safer sex guidelines and avoid sexual practices that may result in contact with feces.

If you are a caregiver of cryptosporidiosis patients, wash hands after bathing patients, emptying bedpans, changing soiled linen, or otherwise coming in contact with the stools of patients.

If you have cryptosporidiosis, wash your hands often to prevent spreading the disease to other members of your household.

For more information on cryptosporidiosis, see the following sources:

Cordell RL, Addiss DG. Cryptosporidiosis in child care settings: a review of the literature and recommendations for prevention and control. Pediatr Infect Dis J. 1994;13(4):310-7.

Dubey JP, Speer CA, Fayer R. Cryptosporidiosis of man and animals. Boston: CRC Press, 1990.

LeChevallier MW, Norton WD, Lee RG. Giardia and Cryptosporidium spp. in filtered drinking water supplies. Appl Environ Microbiol 1991;57(9):2617-21.

MacKenzie WR, Hoxie NJ, Proctor ME, Gradus MS, Blair KA, Peterson DE, Kazmierczak JJ, Addiss DG, Fox KR, Rose JB, Davis JP. A massive outbreak in Milwaukee of Cryptosporidium infection transmitted through the filtered public water supply. N Engl J Med 1994; 331:161-7.

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