Diarrhea and other illnesses of the intestines and stomach are common problems that most people living with HIV face at some point in their lives. Sometimes these conditions are difficult to treat because many different infections can cause diarrhea, including HIV meds. One of the possible conditions is microsporidiosis, which is caused by the micro-organism called microsporidia.

More than a thousand types of microsporidia are known, yet only 14 of them are known to cause disease in humans. The most common types are *E. intestinalis*, *E. cuniculi* and *E. bieneusi*, which most often causes disease in people with AIDS. Although microsporidiosis is not an AIDS-defining condition itself, the wasting that can occur from having this type of condition is.

Cases of microsporidiosis have greatly declined since potent HIV therapy became standard care. The disease is fairly uncommon in the general public. Some evidence points to about half of those with HIV may have microsporidia and perhaps about 1 in 5 will develop the disease.

**What is microsporidiosis?**
While it's mostly a disease of the stomach and intestines, microsporidiosis can affect other parts of the body such as the lungs, bladder, kidneys, eyes, brain and sinuses. Researchers have long classified microsporidia as a parasite, but more recently been found as having qualities of a fungus. It must live inside the cytoplasm of cells in order to produce spores. As more spores are created, infected cells will burst open allowing those spores to infect more cells. It is the spores that cause the disease.

**What are the symptoms?**
Since microsporidiosis can affect different parts of the body, its symptoms often vary from person to person. The more common symptoms are intestinal and include diarrhea that may not improve, dehydration, lack of appetite, abdominal pain, loss of weight and problems with the bladder, gall-bladder and bowel. The dehydration and diarrhea can become debilitating for some.

Symptoms of the lungs can include coughing and difficult breathing. Symptoms of the eye include irritation, redness, pain and altered vision. Sinus, kidney and urinary tract infections can also occur.

Microsporidia can be found in the urine and stool of infected domestic, farm and wild animals. More evidence shows these animals are naturally infected with the 3 types mentioned above. Pet birds, such as love birds and parakeets, can carry microsporidia, as well as some insects. Humans can become infected when they breathe in or eat the spores from these sources, likely from contaminated food or perhaps through sex that's exposed to stool such as rimming.
Microsporidiosis

How is microsporidiosis diagnosed?

Blood and other tests can be used to identify microsporidia. The most commonly used is staining samples of stool, especially if diarrhea is present. Testing urine is useful when infection of the bladder or kidneys occurs. Although the typical symptoms of specific microsporidium may help your doctor diagnose the disease, s/he may order the more expensive TEM test to make sure it’s diagnosed properly. This may be necessary to ensure you get the right type of treatment. Sometimes a biopsy may be used and PCR tests may be used in clinical research. Also, some species cause disease with somewhat different sets of symptoms that may help your doctor better diagnose it.

How to treat microsporidiosis?

Microsporidiosis most often occurs at CD4 counts below 100. Therefore, the best line of defense overall is to ensure you stay on a potent HIV regimen that maintains a high CD4 level. If your current regimen is failing to keep CD4s above 100, then switching to a new regimen should be considered as a way to treat microsporidiosis. This will help keep your immune system strong enough to regain control of the microsporidia.

Since microsporidiosis can sometimes cause severe diarrhea and dehydration, many things may need to be used to help you recover, including using nutritional supplements and either drinking lots of fluids with electrolytes or getting them by IV. Anti-motility and others drugs may also be given. Beyond that, two medicines are most often used to treat the microsporidia: Albenza (albendazole) and fumagillin.

However, fumagillin is not available as an oral drug in the US, but is often used topically with albendazole for eye infections. Oral fumagillin can produce thrombocytopenia, or low platelets. Albendazole is not effective against the intestinal *E. bieneusi*, which can be troubling since this type is common in people with AIDS. The drug nitazoxanide may be effective, but it appears to be less so at lower CD4s. Using itraconazole with albendazole may be useful for systemic disease. Two other drugs, metronidazole and atovaquone, should not be used as they are not active against microsporidia in the lab.

Drugs are not routinely used as maintenance therapy to prevent the recurrence of the disease, except possibly for a stubborn eye infection. Keeping microsporidiosis under control is best done by keeping CD4 counts above 100 through potent HIV therapy. The condition called IRIS has not been reported with microsporidiosis.

How to prevent microsporidiosis?

Although scientists continue to research the disease, it’s not well understood how people get microsporidia. However, some general precautions may be able to reduce your risk for infection. Avoid the sources of microsporidia, such as untreated sources of water, contaminated food and the stool of animals and humans. Washing your hands often is one main way to reduce your risk, especially when handling animals. Fully washing meats, fruits and vegetables and using filtered water may also help. Refraining from oral-anal contact during sex or improving safer sex may reduce your risk.

Drugs are not used to prevent getting the disease. In this case, the best way to prevent it is by keeping your CD4 counts above 100 by using potent HIV therapy.
Who is at risk for microsporidiosis?

Generally speaking, HIV-positive people with weaker immune systems, especially with CD4 counts below 100, are at higher risk for the disease. Some cases are reported in the general public, but the disease occurs more often in people living with HIV.

Special considerations for children and older people

The disease appears to present similarly in all individuals. However, since the diarrhea from microsporidiosis can cause severe dehydration, children and older people may be at a higher risk for complications from not retaining enough fluids. More care and health support may be needed to fully recover from these conditions.

Special considerations for pregnant women

One of the drugs used to treat the disease, Albenza (aldendazole), may cause birth defects and should not be used during pregnancy unless clearly needed. It is not known if a woman can pass the drug onto her nursing infant. Reliable birth control should be used during and up to one month after treatment has ended. Systemic fumagillin may also cause birth defects, although it’s not available in the US. However, the topical version has not been associated with birth defects and is probably safe to use.

What can help to ask my doctor?

- Besides microsporidiosis, what else could be causing my diarrhea?
- Have you tested for everything that could be causing my diarrhea?
- How is my HIV therapy doing? Should we switch regimens to improve my immune system?
- What things can I do to make sure my CD4s stay above 100?

Other publications that may help:

Managing Diarrhea
www.aidsmeds.com/articles/Nausea_4857.shtml

Wasting Syndrome
www.aidsmeds.com/articles/wasting_6934.shtml

SOURCES:

- Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents, April, 2009.
- Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents, December 1, 2009.
- US Centers for Disease Control and Prevention.