What is toxoplasmosis?

Toxoplasmosis is an infection caused by the parasite *Toxoplasma gondii*. The parasite is transmitted to people through eating undercooked meat, especially pork or lamb, contaminated with the parasite. Cats are natural hosts of this parasite, and it may be transmitted to people through contact with cat faeces.

“Toxo” infection most often causes disease in the brain and spinal cord, although other parts of the body, including the eyes, heart, lungs, skin, liver, and gastrointestinal (GI) tract, can be infected. In North America, toxoplasmosis in HIV-positive people is usually a reactivation of an old infection that did not initially cause disease. When someone is first infected with the parasite, there are usually no symptoms, and the immune system is able to control and contain the infection. Over time, HIV-positive people lose more and more CD4+ lymphocytes, the immune system cells that help to keep certain infections under control. As these cells are lost, “toxo” can flare up and cause disease.

HIV-positive people who have been exposed to the parasite and whose CD4+ counts are below 100 are at risk of developing toxoplasmosis.

Symptoms

Toxoplasmosis can be a life-threatening condition. Anyone who experiences any of the following symptoms should contact their physician or the nearest hospital emergency department.

Symptoms of toxo may include:

- dull, constant headache
- intermittent fever
- seizures

Symptoms may also include focal neurological deficits, such as:

- weakness, or even paralysis, of one side of the body;
- speech disorder, especially slurred words;
- weakness or loss of sensation in any limb;
- loss of an area of vision.

Focal neurological deficits are problems caused by disturbances (lesions, tumours, infections, stroke) in a particular area of the brain. They cause a specific loss of sensory or motor function, rather than generalized confusion, dementia, or changes in the level of consciousness. For example, a toxo lesion on the brainstem may cause difficulty swallowing or speaking; a lesion near the area of the brain that controls sight can cause the loss of an area of vision.

Diagnosis

The symptoms of toxo are similar to those of many other conditions that can affect the brain and spinal cord. Physical examinations, lab tests, and radiologic scans are necessary to confirm the diagnosis.

A patient who has any of the symptoms described above will receive a physical examination, including some general tests of the nervous system. If there seem to be neurological problems, the patient will be referred to a
neurologist (a doctor whose speciality is the brain and nervous system).

Blood samples will be taken and tested to find out if the patient has been exposed to the toxo parasite or to other germs which could cause similar symptoms.

The neurologist will conduct an extensive physical examination which will assess cognition (ability to think and reason); motor function (including size, strength, and tone of muscles); sensory nerve function (ability to tell the difference between light and firm touch, etc); coordination (ability to perform certain movements, balance, walk, etc.), and reflexes. This series of tests can allow the neurologist to pinpoint the location of the lesion in the brain. These tests will not confirm the diagnosis of toxoplasmosis, but they can eliminate some other possible diagnoses.

A lumbar puncture (spinal tap) may be done to remove a sample of cerebrospinal fluid (CSF). This fluid will be tested to find out if the patient has been exposed to the parasite or to other germs which could cause similar symptoms. Although antibodies to toxo may be found in the CSF, this test cannot confirm the diagnosis of toxoplasmosis, but can eliminate other possible diagnoses.

Images of the inside of the brain and spinal cord can be produced with a CT scan. In a patient with toxoplasmosis, the scan can reveal multiple lesions in the cortex and deep grey-matter structures such as the basal ganglia. However, the CT images can vary widely: there may be single lesions, lesions with diffuse enhancement, as well as non-enhancing lesions.

The only definitive way to diagnose toxo is through a brain biopsy. This involves cutting open the skull and removing a small piece of brain for analysis in the lab. This procedure is so invasive and potentially so dangerous that it is almost never performed.

Treatment

Treatment for toxoplasmosis may be taken at home or in hospital depending on the size, number, and location of the lesions, the symptoms experienced, and the patient’s ability to tolerate the medications.

The most effective treatment is a combination of the oral antibiotic drugs pyrimethamine (50-100 mg per day) and sulfadiazine (4-8 g per day), plus the B vitamin folinic acid (10 mg per day). Although improvement in symptoms is usually seen within 7 days and on CT scans after 14 days, treatment should continue for at least six weeks.

Pyrimethamine is fairly well tolerated by most people, but its side effects can include nausea, vomiting, and diarrhea in the first few days of treatment. Sulfadiazine can cause skin rashes, itching, sensitivity to light, joint pain, fever, and chills. Both drugs can cause allergic reactions; “sulfa” reactions are common among HIV-positive people. Folinic acid is taken to help protect the bone marrow from the suppressive effects of both drugs.

After all symptoms and signs have cleared up, and the infection has been controlled, daily treatment to suppress the parasite is required. Suppressive therapy usually consists of lower doses of the same drugs that successfully treated the active infection. The most commonly used suppressive therapy combines 25-50 mg of pyrimethamine daily with 500 mg of sulfadiazine taken 4 times a day plus 5-10 mg folinic acid daily.

The pyrimethamine/sulfadiazine combination may not be appropriate for everyone. An alternative treatment combines pyrimethamine (50-100 mg per day) with clindamycin (600-1200 mg, given intravenously every 6 hours) plus folinic acid (10 mg daily) for three weeks. Oral clindamycin (450 mg taken three or four times a day) is taken with the pyrimethamine for at least another three weeks. Suppressive therapy continues with 25-50 mg of pyrimethamine daily plus 300 mg clindamycin (taken four times a day) plus 5-10 mg folinic acid daily.

The most commonly reported side effects of clindamycin include nausea, vomiting, diarrhea, colitis, rash, neutropenia (a decrease in the white blood cells called neutrophils), and increased liver enzymes.
For people who cannot tolerate pyrimethamine, sulfadiazine, or clindamycin, the following treatments have been studied in small numbers of people:

- 75 mg pyrimethamine + 500 mg azithromycin daily
- 750 mg atovaquone taken 4 times a day
- atovaquone + pyrimethamine

HIV-positive cat-owners may help reduce the risk of developing toxo by using dust-free cat litter, and wearing gloves and a mask to remove faeces from the litter box daily. The toxo germs in cat faeces do not become infectious until they have been outside the cat’s body for 24-36 hours. Dust-free litter may help prevent the germs from being inhaled with the dust.

Credits

Author: Deirdre Maclean, B. Toulouse
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Design: Renata Lipovitch

Disclaimer

Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV-related illness and the treatments in question.

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Contact CATIE

by telephone
1.800.263.1638
416.203.7122
by fax
416.203.8284
by e-mail
info@catie.ca
on the Web
http://www.catie.ca
by mail
505-555 Richmond Street West
Box 1104
Toronto, Ontario
M5V 3B1
Canada

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