Toxoplasmosis — A Misunderstood Disease

What is Toxoplasmosis?

Toxoplasmosis is a disease of virtually all warm-blooded animals, including humans. It is caused by a microscopic protozoan intestinal parasite named *Toxoplasma gondii*, that occurs worldwide. Cats are the sole definitive host of the parasite, in other words, they are the only known animals to carry the *adult* parasite and then pass environmentally resistant eggs in their feces. Cats passing the *Toxoplasma* **eggs** (oocysts) can then in turn cause infection in other animals and humans.

Once infected, most healthy cats and humans do not exhibit any clinical signs, with the majority of people unaware of the infection. However, infection may occasionally cause mild nonspecific and self-limiting flu-like signs (e.g. sore throat, enlarged lymph nodes, headache, fever, fatigue, diarrhea) which typically last only a few days.

Women who ingest oocysts for the first time during pregnancy have no antibodies to protect themselves or their fetuses against the disease. If this occurs during the first trimester stillbirth, abortion, and severe central nervous system disease can occur in the fetus. Human fetuses are actually more likely to be infected if exposed during the second or third trimester but the resultant disease is usually milder. Women previously infected with *Toxoplasma* develop immunity and are unlikely to transmit the disease to their unborn children, even if they are exposed again to *Toxoplasma* during gestation.

In immune compromised persons—those undergoing immunosuppressive therapy (e.g., for cancer or organ transplantation) or those with an immunosuppressive disease such as AIDS—toxoplasmosis can be a serious, even potentially fatal, disease. However, studies have shown that in AIDS patients, acquiring *Toxoplasma* appears unrelated to cat ownership.

How is Toxoplasmosis Spread?

Cats can become infected congenitally, by ingestion of oocysts from fecal contamination, or most commonly, by ingestion of tissues from intermediate hosts that may be infected with *Toxoplasma* like rodents, birds, reptiles, or occasionally insects (cockroaches, earthworms, and dung beetles may sometimes serve as accidental hosts of *Toxoplasma*). Within a month of becoming infected with *Toxoplasma*, previously unexposed cats shed millions of oocysts, but for only short periods of time, usually less than three weeks. After that, the cat develops immunity against recurrence and rarely sheds oocysts again.

Once passed out in the feces, oocysts must incubate in the environment for one to five days before becoming infective to other animals or humans. However, once oocysts reach the infective stage (sporulated) they can survive in cat stool or soil for up to 18 months. When sporulated oocysts are swallowed by other animals or humans they hatch and multiply within muscle tissue where they remain, in many cases, for the life of the immune host.

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Toxoplasma infection in people is very common with an estimated 30 to 50 percent of the world's human population positive for previous or current infection. *Most commonly people acquire toxoplasmosis when exposed to contaminated soil or drinking water and from eating undercooked meat, particularly lamb and pork.*

Toxoplasmosis

Laboratory Testing Considerations

Fecal examinations of cat stool have very limited value because oocysts are shed for only a short time during active infections and are often difficult to positively identify on routine fecal examinations.

Blood tests (titers) can be performed to determine if a cat has been previously infected. An antibody called IgM will increase in a cat's blood about 1 or 2 weeks after exposure to *Toxoplasma*, but will remain elevated for only about 3 months. This roughly coincides with the period in which a newly infected cat is likely to shed oocysts in its feces.

As a cat overcomes an active infection and becomes immune, an antibody called IgG will increase in the blood stream and remain elevated for about a year. If IgG titers are present and subsequently increase over 2 to 3 weeks, an active or recent infection can be diagnosed.

A cat with negative titers is vulnerable to becoming infected and thus can potentially release oocysts into its environment. Cats with positive titers are actually less likely to spread toxoplasmosis than are cats with negative titers, because by the time these antibodies have risen, the cat has likely finished passing oocysts in its stool and is unlikely to shed them again. It is often difficult to definitively diagnose a cat that is actively passing oocysts in its stool, which is the period of time that human infection is possible.

By conducting antibody titers from human blood, a woman can be evaluated for the risk of transmitting toxoplasmosis to her unborn child. In general, women with positive titers do not have to worry about passing the infection to their babies, whereas women with negative titers to *Toxoplasma* are vulnerable to infection and should therefore take measures to prevent exposure. Your physician should be consulted if you have questions about this test.

Recommendations for Minimizing Potential Exposure

- Meats should be thoroughly cooked to inactivate tissue cysts.
- Gloves should be worn or hands washed well after handling raw meat or vegetables.
- Gloves should be worn when working with potentially contaminated soil.
- Cover children's sandboxes to prevent contamination by cats.
- Dispose of feces from litter boxes daily to remove oocysts before they can sporulate and become infective.
- Disinfect potentially contaminated litter boxes with scalding water or steam. Sporulated oocysts are extremely resistant to most disinfectants.
- Protect cats from infection by preventing access to birds, rodents, uncooked meat, and insects.

People and Their Cat

Does this all sound confusing? It is! In summary, toxoplasmosis is a difficult disease to diagnose in the cat. With the exception of susceptible pregnant women and immune compromised individuals, however, toxoplasmosis is usually a fairly benign illness and surprisingly common. People should not be afraid to have a cat. All available data indicates that ownership of a pet cat does *not* increase the risk of infection with *Toxoplasma*. By checking *both* the woman *and* cat, recommendations can be made, however, testing a pet cat alone, limits the scope of those recommendations.

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