Toxoplasmosis



What is toxoplasmosis?

Toxoplasmosis is an infectious disease caused by a parasite that spreads from animals to humans. It is a common disease that is seldom recognized because most infected people do not develop signs or symptoms. In those who have symptoms of the disease, the illness is usually mild, with swollen lymph nodes and some discomfort.

What causes toxoplasmosis?

The microorganism Toxoplasma gondii causes toxoplasmosis. This protozoan parasite infects wild and domestic animals including birds, cats, sheep, goats, cattle, pigs and poultry. Cats are the most common source of the Toxoplasma protozoa that are transmitted to other animals or people.

There are three forms of Toxoplasma gondii: the tachyzoite (the rapidly reproducing form), the bradyzoite (a slower reproducing form contained in tissue cysts), and the sporozoite (contained in oocysts).

The tachyzoite is the form that can invade cells in the body where it then multiplies rapidly and can destroy cells. When the cells die, the tachyzoites are released and infect other cells. For this reason, tachyzoites are seen in many tissues and organs throughout the body that are infected during this acute phase of the disease. This is also called the extraintestinal phase of the infection since it can affect all cells outside the intestines in all infected animals. However, only cats (see below) have the intestinal phase of the infection.

Two or three weeks after the first infection, the Toxoplasma microorganism divides more slowly and a protective membrane forms around the parasite cells. The cyst containing the parasites is called a zoitocyst and the cells inside the cyst are called bradyzoites. The tissue cysts are formed primarily in brain, eye, heart muscle, and skeletal muscle. Bradyzoites persist in tissues for many years, possibly for the life of the host.

In cats, the Toxoplasma parasites infect the lining of the small intestine where they reproduce asexually. After a few days of rapid reproduction, the cells transform into a sexual form, combine, and become enclosed in a cyst called an

oocyst. Oocysts contain the sporozoite form of the Toxoplasma parasite. Oocysts are found in both wild and domestic cats but not in any other animals or birds.

Cats become infected by ingesting food contaminated with oocysts from feces or with tissue cysts (zoitocysts) from the flesh of infected animals. Infected cats shed millions of oocysts in the feces during the two-week period of the intestinal phase of the infection (i.e., when asexual reproduction of the Toxoplasma microorganisms occurs). These oocysts can survive in soil for several months and are the major source of infection. Once swallowed, the oocyst burst in the intestines and spreads to the rest of the body through the bloodstream.

How is toxoplasmosis transmitted?

Toxoplasmosis (in humans) occurs from eating improperly cooked meat, especially lamb (mutton), pork, and deer (venison), or from drinking unpasteurized milk contaminated with Toxoplasma gondii. Cooking meat (inner temperature about 70°C or 160°F) or freezing it (about -18°C or 0°F) should destroy the parasite.

Toxoplasma gondii can also be transmitted by handling contaminated animals, raw meat or having contact with food (e.g. raw or under cooked pork or beef), water, dirt (soil), or dust contaminated with cat feces. Direct contamination is possible through open wounds. If people do not wash their hands after contact with contaminated material or before eating or drinking, the organism is transferred from the hands to the mouth and is then swallowed. Infection from blood transfusions and organ transplants from infected donors is rare, but it has been reported.

Toxoplasma gondii has been found in the kidneys, bladder and intestine of infected humans. There have been rare cases of organ transplant recipients acquiring toxoplasmosis infection.

Contaminated human urine and feces could possibly be a source of infection but transmission from this source has not been proved.

Person to person transmission occurs only from mother to child. A pregnant woman who acquires toxoplasmosis infection can pass the organism to the developing fetus through the placenta. The risk of the fetus being affected and the severity of the disease depends on what stage during pregnancy the mother acquires the infection. The baby is most at risk if the mother becomes infected in the third trimester, but the earlier in the pregnancy the infection occurs, the more serious the outcome for the baby. Many early infections end in stillbirth or miscarriage. Infants who survive may have issues such as seizures, enlarged liver and spleen, yellowing of skin and eyes (jaundice) or severe eye infections. Some effects are not seen at birth, and may occur in their teen years or later.

What are the symptoms and signs of toxoplasmosis?

Toxoplasmosis is seldom diagnosed or reported because most patients with a healthy immune system have no signs or symptoms of the disease. Some short-term effects of toxoplasmosis may include fever, muscle pain, sore throat, headache, swollen lymph nodes and fatigue. Unless tests are carried out to confirm a Toxoplasma infection, these symptoms can be mistaken for the “flu”.

The long-term or chronic effects of the infection result when the cysts spread

to the brain and muscle cells. The cysts, which can stay in the body as long as the person lives, can rupture and cause severe illness including damage to the brain, eyes and other organs. Another form of the disease (ocular toxoplasmosis) can also affect the eyes leading to partial loss of sight or to blindness in one or both eyes.

In individuals with a compromised immune system, toxoplasmosis may cause serious illnesses.

How long does it take to develop toxoplasmosis?

The time between contact with the infected source and the development of the disease is not known. In one outbreak caused by eating under cooked meat, the disease developed 10 to 23 days after exposure. Another outbreak caused by contact with contaminated cat feces occurred 5 to 20 days after exposure.

What is the treatment for toxoplasmosis?

Medical advice should be sought if infection is suspected. The need for and the length of treatment depends on the severity of the infection or the possibility of damage to vital organs. Toxoplasmosis is treated primarily with antibacterial and anti-parasitic drugs for about four weeks.

Laboratories can perform blood and tissue tests to confirm infection with Toxoplasma gondii.

What occupations are at risk?

Sources of occupational infection include contact with infected raw meat, infected animals, contaminated soil or water, or contact with contaminated cat feces. Laboratory personnel who have handled contaminated needles or glassware have also contracted toxoplasmosis.

Toxoplasmosis is an occupational risk for:

- animal care workers including breeders, keepers, zoo attendants, veterinarians or their associates
- slaughterhouse workers, meat inspectors, line processors, butchers or cooks
- agricultural workers
- landscapers and gardener
- laboratory workers
- health care workers

How can we prevent toxoplasmosis?

SPECIFIC PRECAUTIONS

Animal Care Workers and Zoo Attendants

Remove all feline feces daily. Dried litter should be disposed of without shaking. Flush feces down the toilet, carefully bag them for disposal, burn them or bury them deeply. Disinfect litter pans daily by scalding. Wear disposable gloves when handling litter boxes or working in soil or sand that is possibly contaminated with cat feces. Wash hands after removing gloves.

House all members of the cat family in a separate room or building to prevent infecting other animals. Autoclave or heat to 70°C (for at least 10 minutes) any brooms, shovels and other equipment that have been used to clean cat cages or enclosures.

Do not feed cats raw meat. If this is not possible, feed meat that has been previously frozen as it is less likely to be infected than fresh meat. Where practical, use and store equipment and tools for cleaning up cat feces in the area where cats are housed.

Slaughterhouse Workers, Meat Inspectors, Line Processors, Butchers, Cooks and Others Contacting Raw Meat

Where appropriate gloves when in contact with raw meat. Wash hands thoroughly with soap and water. Do not touch mouth and eyes when handling raw meat. Wash all cutting boards, knives, sink tops and other materials that come into contact with raw meat with soap and water. Control roaches or other insects that can come into contact with food or areas where food is prepared. They may transfer oocysts to uncovered food.

Agricultural Workers

Soil can be a source of transmission particularly if it is used by cats. Wash hands after working in the soil or after contacting animals. Confirm the cause of abortion in animals. Send the placenta, fetus and blood samples to a laboratory to confirm the presence of Toxoplasma gondii. Do not handle fetal membranes and dead fetuses with bare hands. Fetal material that is not sent to the laboratory should be buried or incinerated. Remove placentas and aborted material from access by cats or rodents as a potential source of further infection. Do not allow cats access to stored feed.

Remove all cat feces from feed. Keep only adult barn cats by spaying females and driving new cats away. Adult cats are likely to have acquired resistance and are thus unlikely to shed oocysts in their feces.

Landscapers and Gardeners

Wear gloves to avoid exposure to Toxoplasma gondii when contacting soil contaminated with infected cat feces. Wash hands after removing gloves.

Laboratory Workers

Pregnant women should be discouraged from working with the Toxoplasma species.

Protective clothing should be worn by workers exposed to contaminated materials. Contaminated clothing should be labelled with a biohazard warning and washed using laundry procedures for disinfection.

Production and exposure to aerosols from animal tissues should be minimized.

Health Care Workers

Transmission of the disease from contaminated human urine and feces has not been proven. As a precaution, always wear disposable gloves when **handling** patients who have poor bowel control.

Wash hands and nails thoroughly with soap and water after removing gloves.

GENERAL PRECAUTIONS

Pregnant women should avoid cleaning litter pans and contact with cats of unknown feeding history. If no one else can clean the litter, wear disposable gloves and wash your hands with soap and water afterwards.

Wear gloves when gardening or cleaning litter boxes. Wash your hands with soap and water after these activities, and before eating or drinking.

Feed pet cats only dry, canned or cooked food. Try to keep pet cats indoors to discourage scavenging for food.

Cover children’s sandboxes to keep cats from using it as a litter box.

Eat meat that has been thoroughly smoked, cured or cooked.

Wash fruit and vegetables before eating.

Do not eat raw eggs. Do not drink unpasteurized milk or other dairy products.

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