



Risk Warning: The Importance and Role of Domestic Cats in the Transmission of *Toxoplasmosis* to Humans

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Toxoplasmosis is a zoonotic disease whose final hosts are cats, and its intermediate hosts are humans and other mammals. This disease does not cause many problems in cats, but it leads to many problems in intermediate hosts such as humans, especially in pregnant women and people with weakened immune systems (1). *Toxoplasma gondii* is an obligate intracellular parasite with worldwide distribution and belongs to the order of Coccidia (2).

As long as the body's immune system is active, the parasites come in the form of cysts (bradyzoite or chronic form). However, if the body's immune system is reduced or impaired, it becomes active, and its clinical symptoms are revealed (3). Given the increasing incidence of AIDS and cancer in the world and other immune-suppressing diseases in which the immune system is weakened, and considering that cancer patients and those receiving organ transplants or immune-mediated patients use drugs that suppress their immune systems, *Toxoplasmosis* and other opportunistic secondary infections can occur. Thus, this article aimed to indicate the need to identify the parasite in these people as much as possible (4).

The classification presented below is based on the international classification of protozoists.

Kingdom: Protista

Subkingdom: *Protozoa*

Phylum: *Apicomplexa*

Class: *Sporozoea*

Subclass: *Coccidia*

Order: *Eucoccidia*

Suborder: *Eimeriina*

Family: *Sarcocystidae*

Genus: *Toxoplasma*

Species: *Toxoplasma gondii*

Toxoplasma gondii has two separate models in its life cycle, i.e., extra-intestinal cycle and enter epithelial cycle (Figure 1). This parasite has both cycles in cats and felines, while in intermediate hosts there is only an extra

Author's Biosketch

Ali Shabestari Asl is a Ph.D. holder in Small Animal Internal Medicine and a member of the academic staff. Also, he is an assistant professor of Small Animal Internal Medicine in the Department of Clinical Sciences, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran. He has more than 28 years of experience teaching at the university and working as a clinician in a veterinary hospital. He was the head of the Tabriz Branch Pet Clinic for more than 12 years. He is a small animal internist and has authored more than 30 ISI manuscripts and given more than 25 lectures at different congresses across the world. He is currently teaching internal medicine and researching internal diseases in small animals, and his main areas of interest include various diseases of small animals, especially zoonotic diseases and infectious pathogens of these animals.



intestinal cycle (5).

Toxoplasmosis Transmission Ways

The transmission ways of *toxoplasmosis* are divided into main and secondary ways (6).

1) The Main Ways of Transmission

- A. Transmission by oocysts.
- B. Transmission by tissue cysts.
- C. Transmission by tachyzoite or congenital transmission.

2) The Secondary Ways of Transmission

- A. Transmission through blood, leukocyte, or organ transplant.
- B. Transmission through laboratory contamination.
- C. Transmission through milk consumption.
- D. Transmission by birds and insects.
- E. Genital transmission.



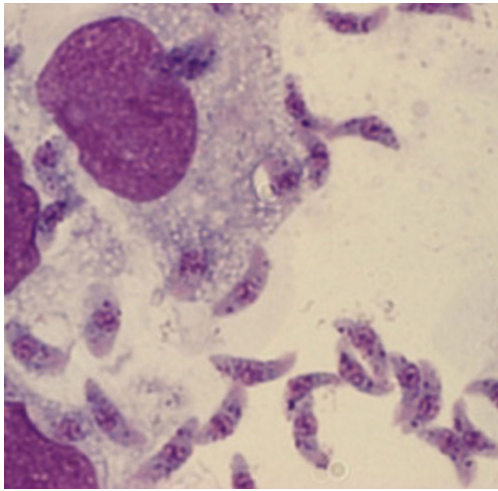


Figure 1. *Toxoplasma gondii* Tachyzoites

Toxoplasmosis Treatment

In the treatment of toxoplasmosis, the following points should be observed (7):

- A. Medical history, physical examination, and blood laboratory tests (IgM and IgG) help to diagnose the infection.
- B. For a healthy, non-pregnant, and asymptomatic person, treatment is often not necessary.
- C. Medicines are prescribed for children under five years of age to prevent eye complications that may occur later.
- D. Pregnant mothers should be under the supervision of their doctor.
- E. Patients with defective immune systems and infants are often treated with medication.

Prevention and Control of Toxoplasmosis

In the control and prevention of Toxoplasmosis, all the following measures should be taken (8,9):

- A. As far as possible, do not consume grilled meat and half-cooked bird viscera, and cook food and meat completely at a temperature of 60 degrees.
- B. The meat should be frozen at -18°C for 10 days.
- C. Before the parasite eggs in the cat's feces become contaminating (activation period), they are destroyed by incineration or deep elimination on a daily basis.
- D. Pregnant mothers should avoid contact with a cat that may be a carrier of the disease, as well as avoid gardening and wear gloves while working.
- E. After touching hands with raw meat or gardening in places where water may be contaminated with cat feces, wash your hands.
- F. Food, especially raw or undercooked meat, should be kept away from the reach of animals, especially cats.
- G. Vegetables and fruits should be thoroughly washed and disinfected.

- H. Contact with blood and medical equipment contaminated with blood should be avoided.
- I. Donated blood should be tested for Toxoplasmosis.

Important Tips for People Who Have a Pet Cat

For this purpose, the following hygiene measures should be taken (10,11):

- A. Wash your hands after petting, combing, or being licked by a cat if the cat is suspected to be infected.
- B. Keep your cat indoors and clean the litter box every day.
- C. Put the cat feces in a plastic bag and put it in the garbage.
- D. Do not put fertilizer in the cat litter box and keep it away from the garden.
- E. Do not feed your cat with raw or undercooked meat. Rather, it is recommended to use commercial canned and dry food to feed the cat.
- F. See your veterinarian if you notice any signs of illness in your cat.
- G. The best way to prevent infection even if the domestic cat is infected with *Toxoplasma* is to clean the litter box daily because if the cat's feces container is cleaned, there will not be enough time for the oocysts excreted by the infected cat to become active.

The Main Warning in Big Cities

Today, with the increase in human population in the big cities of the world and due to the increase in the amount of waste disposed of in the cities and the lack of proper and hygienic collection of this waste by municipal officials, unfortunately, most of this waste contains large amounts of human food remains, which are known as the main source of food for stray cats in the cities. The high reproduction rate of cats has caused an excessive increase in the population of stray cats in the cities, and parasitic diseases can be transmitted from the cats to humans in the same proportion (12,13).

Competing Interests

None.

Ethical Approval

Not applicable.

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