TOXOPLASMOSIS

Etiology

Toxoplasma gondii is the organism responsible for toxoplasmosis

T. gondii infection occurs worldwide with about 5% to 50% of adults in the United States of America having toxoplasma antibodies. About 1% to 6% of domestic cats in Europe excrete oocyst of toxoplasma gondii in their feces and about 1% of cats in the United States shed the Toxoplasma cysts. Sheep, Goats, Cattle and Pigs are frequently infected. Toxoplasma infection is usually sporadic, but outbreaks associated with ingestion of raw meat or contaminated water supply.

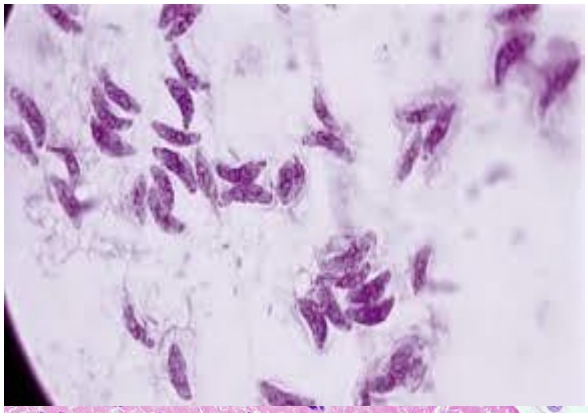
1. **Epidemiology :** the parasite is found throughout the world, more than 60 million people in the United States may be infected with the *Toxoplasma* parasite. Of those who are infected, very few have symptoms because a healthy person's immune system usually keeps the parasite from causing illness. However, pregnant women and individuals who have compromised immune systems should be cautious; for them, a *Toxoplasma* infection could cause serious health problems **(CDC , 2017)**

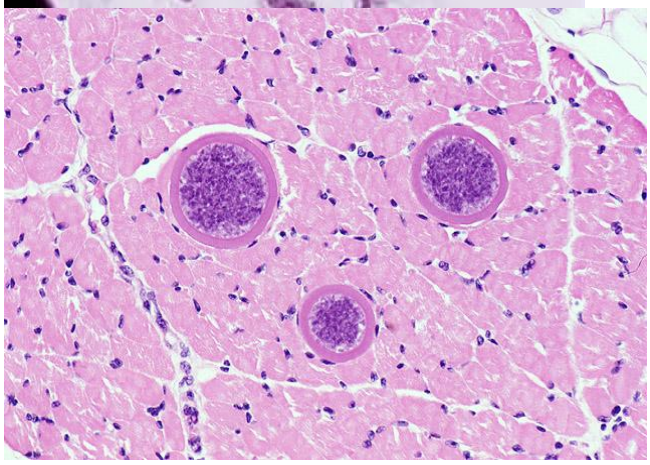
Morphology

Tachyzoites – these are the proliferative forms of toxoplasma gondii that reproduce rapidly within macrophages by endogenous budding. Tachyzoites are sickle-shaped cells that are about 4 to 7 micrometer long and 2 to 4mm wide.

2. **Bradyzoites** (also called **cystozoites**) – these are the forms that undergo slow reproduction within the cysts. The cysts have relatively resistant walls and can grow as large as 150 micrometer – containing up to several thousand bradyzoites.

3. **Oocysts** are the rounded and encysted stages of toxoplasma parasite that have resistant cyst walls – measuring about 9 by 14 micrometer in size.





Life cycle

The natural life cycle of *T. gondii* occurs in cats and small rodents, although the

parasite can grow in the organs (brain, eye, skeletal muscle, etc.) of any mammal or birds

Cats gets infected by - **ingestion of cysts in flesh.**

- Decystation occurs in the small intestine, and the organisms penetrate the submucosal epithelial cells where they undergo several generations of mitosis,

finally resulting in the - development of micro- (male) and macro- (female) gametocytes.

- Fertilized macro-gametocytes develop into oocysts that are discharged into the gut

lumen and excreted.

- Oocysts sporulate in the warm environment and are infectious to a variety of animals including rodents and man.

- Sporozoites released from the oocyst in the small intestine penetrate

the intestinal

mucosa and find their way into **macrophages** where they divide very rapidly) and form

a cyst which may occupy the whole cell.

- The infected cells burst and release the tachyzoites to enter other cells, including

muscle and nerve cells, where they are protected from the host immune system and

multiply slowly (bradyzoites).

- **Symptoms**

Most people who become infected with *Toxoplasma gondii* are not aware of it.

Some people who have toxoplasmosis may feel as if they have the "flu" with swollen lymph glands or muscle aches and pains that last for a month or more.

Severe toxoplasmosis, causing damage to the brain, eyes, or other organs, can develop from an acute *Toxoplasma* infection or one that had occurred earlier in life and is now reactivated. Severe cases are more likely in individuals who have weak immune systems, though occasionally, even persons with healthy immune systems may experience eye damage from toxoplasmosis.

- Signs and symptoms of ocular toxoplasmosis can include reduced vision, blurred vision, pain (often with bright light), redness of the eye, and sometimes tearing. Ophthalmologists sometimes prescribe medicine to treat active disease. Whether or not medication is recommended depends on the size of the eye lesion, the location, and the characteristics of the lesion (acute active, versus chronic not progressing). An ophthalmologist will provide the best care for ocular toxoplasmosis.
- Most infants who are infected while still in the womb have no symptoms

at birth, but they may develop symptoms later in life. A small percentage of infected newborns have serious eye or brain damage at birth.

Diagnosis

Toxoplasma gondii Tests for diagnosis

1. Immunofluorescence assay for IgM antibody is used
2. Culture of the organism can be done
3. Microscopic examination of Giemsa-stained specimens will identify presence of trophozoites in acute infections. The trophozoites are crescent in shape.

Toxoplasma gondii Prevention

1. Avoid eating undercooked meat - properly cook meat before eat
2. Pregnant women should avoid disposing cat litter

Treatment

Acute infections benefit from pyrimethamine or sulphadiazine. Spiramycin is a successful alternative.