Toxoplasma gondii

Toxoplasma gondii is a parasitic protozoa that causes the disease toxoplasmosis. This disease is usually minor and self-limiting in the immunocompetent but can cause serious disease in the immunocompromised.It is also a cause of congenital TORCH infections in a fetus whose mother contracts the disease during pregnancy due to the ability to cross the placenta. The life cycle of this parasite has two phases. The sexual phase takes place only in cats and the asexual phase can take place in other warm-blooded animals. Inside both hosts, the parasite invades cells and forms a vacuole and forms bradyzoites. The vacuoles containing the bradyzoites form cysts, usually in the tissues of the muscles and brain. The disease is transmitted to humans via consumption of undercooked meat containing cysts or ingestion of cysts from cat feces. During acute toxoplasmosis, symptoms are often mild with minor lymphadenopathy or muscle aches. However, the immunocompromised can develop severe disease including encephalitis and brain abscesses. Classically, brain abscesses in HIV patients appear as multiple ring-enhancing lesions on imaging. Treatment includes sulfadiazine and pyrimethamine.



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Characteristics

Protozoa
Propeller-protozoa
Toxoplasma gondii is a protozoa, which are unicellular eukaryotic organisms.

Cysts in Meat or Cat Feces
Sisters on meat in cat litter box
The disease is transmitted to humans via consumption of undercooked meat containing cysts or ingestion of cysts from cat feces.

Signs and Symptoms

Brain Abscess in HIV Patients
Brain in Abscess-guy with Band-AIDS
The immunocompromised can develop severe disease including encephalitis and brain abscesses due to cyst formation in the tissue.

Ring-enhancing Brain Lesions
Multiple Rings
Classically, brain abscesses caused by Toxoplasma gondii appear as multiple ring-enhancing lesions on imaging. Toxoplasma gondii is the most common cause of ring-enhancing lesions in the brain of HIV patients.

Crosses Placenta in Pregnant Women
Pregnant-woman
This protozoa can cross the placenta of pregnant women and have detrimental effects on the growing fetus. Therefore this organism is one of the causes of congenital TORCH infections.

Congenital TORCH Infection
Torch
The protozoa can cross the placenta of pregnant women and have detrimental effects on the growing fetus. Therefore this organism is one of the causes of congenital TORCH infections and infants present with classic triad of symptoms including chorioretintiis, hydrocephalus, and intracranial calcifications.

Treatment

Pyrimethamine
Pirate-moth-man
Pyrimethamine is a medication used for protozoal infections. This drug interferes with tetrahydrofolic acid synthesis by inhibiting the enzyme dihydrofolate reductase, which is necessary for DNA and RNA synthesis in many species including protozoa.

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Sulfadiazine

Sulfur-dice

Sulfadiazine is a sulfonamide antibiotic that is used in combination with pyrimethamine to treat toxoplasmosis.

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