

Parasitic pathogen essay sample



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Toxoplasma gondii is a parasite that lives within the cell under phylum Apicomplexa. The main host bodies, considered by this parasite, are cats and other felids by which its life cycle can only be completed. *T. gondii*'s life cycle has two phases which are the sexual and asexual part. Sexual part occurs inside the body of a Felicidae family. Asexual part occurs in the body of any warm-blooded animals and humans.

The parasite invades the cells. It forms vacuoles containing bradyzoites which then develop into a parasite. The vacuoles form cysts in the muscles or brains. The immune system of the host body cannot detect the cysts because the parasites live within the cells. Inside the vacuoles, the parasite multiplies through binary fissions until the cell bursts releasing tachyzoites. Tachyzoites are motile. They are the asexual form of this parasite. Compared to bradyzoites, these tachyzoites can be detected by the host's immune system and can be eradicated. But some tachyzoites develop into bradyzoites.

Ingested tissue cysts survive in the stomach and the parasites infect the epithelial cells of the small intestine where sexual reproduction and oocyst formation occurs. The parasite passes through the macrophages of the intestinal lining which goes into the blood stream eventually spreading throughout the body of its host. The oocysts pass out from the host body with the feces. Feces can cause infection after which oocyst develops and becomes potentially pathogenic.

Humans usually have been infected by this parasite through interaction with cats or by eating undercooked meats. Eating raw meat of infected animals, birth by

infected mother, and contact with cat's feces are usually means of infection in animals. Other transmission means of this parasite is through drinking contaminated water, or through organ transplant from infected body and blood transfusion.

Meat infected by this parasite formed a cyst which is hard and can survive in extreme cold temperature up to –12 degrees Celsius. It still survive with chemical disinfectants. It also lives in an environment more than a year. But it can be killed under high temperature of above 66 degrees Celsius and through storage in freezer for 24 hours.

Immunity status, timing of infection and the genetic composition of the host and the organism are basis of response with this parasitic infection. Animals specifically sheep, pigs, cattle, rabbits and monkeys experienced body incoordination, seizure, tremors, head shaking and any other neurologic reaction. It impairs memory and learning in mice. A study also shows that infected rats become less neophobic which diminishes the natural instinct for cat's odor.

In human, the infection causes still birth or abortion by pregnant women. The organism crosses the placenta and infects the fetus. Infection of fetus leads to hydrocephalus, intracranial calcification, chorioretinitis, seizure, deafness, cerebral palsy and mental retardation. In adults, it is associated with psychiatric symptoms such as delusion and hallucination. Alteration in behavior and psychomotor skills has also been associated with this parasitic infection.

Personality of individual infected can be altered by this parasitic infection such as antisocial attitudes in men and promiscuity and decrease of novelty seeking. There are studies suggesting that male infected have lower IQ, shorter attention span, more independent, suspicious, jealous and morose. Infection makes women more outgoing, friendly and more promiscuous.

Some studies points out the possible role of this parasite with cases of schizophrenia and paranoia. Schizophrenia, which is a chronic disease of central nervous system, is logically be caused by infection of the parasite. The *T. gondii* which infest brain tissue with long term infection starting from pregnancy, is considered an etiologic agent of that disease.

Clinical studies are made to treat the infection of this parasite. Some organism specifically *Neospora caninum* and *Hammondi hamondi* , which are closely related to *T. gondii* , are studied for treatment due to reactivity on serological aspect. Molecularly cloned organism-specific and stage-specific antibodies are used to treat the parasitic infection to help determine the specificity and the timing of infection.

Acute infection are treated with pyrimethamine, an antimalarial medication, or sulfadiazine which is used in combination with pyrimethamine, or clindamycin which is used for treatment of HIV/AIDS. Pregnant women are treated with the antibiotic Spiramycin,

Worse infection is treated with atovaquone, an antibiotic used to kill toxoplasma cysts in situ in Aids patient and combined with clindamycin which was said to kill cysts optimally in mice.

Work Cited

Toxoplasmosis. Laboratory Identification of Parasites and Public Health Concern. <http://www.dpd.cdc.gov/dpdx>

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