

## TOXOPLASMOSIS AMONG STREET CATS IN ORADEA

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### **Abstract**

*Toxoplasmosis is a disease produced by the protozoar *Toxoplasma gondii*. The disease has a high prevalence in humans and animals, especially in the northern hemisphere. Theoretically, any warm-blooded animal can be an intermediate host, but the evolutionary cycle is considered to be ended only for cats, which are definitive hosts. Cats excrete into the feces the form of resistance of the protozoan (oocysts), which can withstand the environment for months. People become infected by ingestion of insufficiently heat-treated infected meat or by eating food and water contaminated with oocysts from cat feces.*

**Key words:** toxoplasmosis, cat, zoonosis, oocysts

### **INTRODUCTION**

There are three infectious stages of *T. gondii*: tachyzoites (in groups), bradyzoites (in tissue cyst) and sporozoites (in oocysts).

The tachyzoite enters the host cell by actively penetrating its membrane. After penetration, the tachyzoite is rounded and it is surrounded by a parasitophore vacuole (VP). It has been suggested that this vacuole would be produced by both the parasite and the host cell. Numerous intravascular tubes connect the parasitophore vacuole membrane to the parasite pellicle.

Within the host cell, the tachyzoite is asexually multiplied by repeated endodyogeny. Endodyogeny (*endo* = inside, *dyo* = two, *genus* = birth) is a specialized form of reproduction where two descendants form within the genitor parasite they consume. Tachyzoites continue to divide by endodyogeny until the host cell is full of parasites.

Cats excrete oocysts after ingestion of tachyzoites, bradyzoites, or sporozoites. The prepatent period (between the initial time of infection and the removal of oocysts through the faeces) and the frequency of oocyst elimination vary with the evolutionary stage of *T. gondii* ingested. This period is 3-10 days after ingesting tissue cysts and 14 days or more if tachyzoites or oocysts are ingested. Fewer than 50% of cats shed oocysts

after ingesting tachyzoites or oocysts, whereas nearly all cats shed oocysts after ingesting tissue cysts.

After the ingestion of tissue cysts by cats, the cyst wall is dissolved by proteolytic enzymes in the stomach and small intestine.

## **MATERIAL AND METHOD**

*Toxoplasma gondii* develops from the diheteroxenous type in the schizogonic phase, parasites various tissues and organs, secretions, excretions of I.H. (intermediate host), and in gametogonic phases in the intestine of D.H. (definitive host). Sporogony is exogenous.

I.H. is infected by mouth, by ingesting evolved oocysts, cysts that release sporozoites, which penetrate into all systems, tissues, and develop through endodiogenetic formation of pseudocysts. After several generations, cysts are formed, more commonly in the brain, myocardium and the skeletal muscles. In females during pregnancy, trophozoites cross the placental barrier, infecting the fetus. Parasites end up in all liquids, secretions and excretions (milk, saliva). D.H. is contaminated by cysts and trophozoites, when the gametogonic development follows in the intestinal mucosa, forming oocysts, which are eliminated by faeces in the external environment. In D.H. infections with mature oocysts are possible, in which case sporozoites pass through the intestinal wall and produce parasitemia, with trophosis and cysts in various organs (1,3,4). In the intestinal epithelium there are macro- and microgametocytes with macro- and microgamets and zygote.

Toxoplasmosis can be transmitted in the following ways:

- oral, with oocysts taken through food and water;
- oral, with meat cysts and contaminated foods;
- congenital, proven in female, sheep, sow, bitch, cat, rat and mouse females;
- semen from ram and goat;
- galactopoietic, in sheep and probably goat;
- transcutaneous, less frequent.

The experiment was carried out on 30 cats from different areas of Oradea brought to Vet Clinic by volunteers. Cats were from the street, without owners, with no knowledge of internal or external disinfestation for prevention purposes. As a method, the microscopic examination - the flotation method - with 20x and 40x lenses was used. By this method, oocysts of *T. gondii* were highlighted. Serological methods or IDEXX rapid tests may also be used.

## **RESULTS AND DISSCUSIONS**

All 30 cats brought to the cabinet to be tested proved positive to *Toxoplasma gondii*. It usually parasites the host (both definitive and intermediate) without generating clinical signs. They very rarely produce serious clinical manifestations. Most natural infections are probably due to the ingestion of tissue cysts in undercooked or uncooked meat or by ingesting food and water contaminated with oocysts from infected cat faeces. Bradyzoites from toxoplasmic cysts or oocyst sporozoites penetrate intestinal epithelial cells and multiply. *Toxoplasma gondii* may affect mesenteric lymph nodes at first, then spread via blood and lymphatic channels to other organs. An infected host may die from bowel necrosis and mesenteric lymph nodes before other organs are seriously damaged. In many organs focal areas of necrosis may occur. The clinical picture is determined by the degree of stretching of the lesions in different organs, especially vital ones such as the eye, heart and adrenal glands. Necrosis is the result of intracellular development of tachyzoites. *Toxoplasma gondii* does not produce toxins.

## CONCLUSIONS

Infection with *Toxoplasma gondii* in humans is very prevalent throughout the world. Approximately half a billion people from around the globe have anti-*T. gondii* antibodies. Percentages of infection in humans and animals differ from one geographical region to another. The cause of these variations is not yet known. Environmental conditions, culinary habits of humans and fauna are some of the factors that can determine the degree of infection with *T. gondii*. Prevalence is higher in hot and humid climates than in dry and cold climates. Only a small percentage of the population (less than 1%) have congenital toxoplasmosis.

Women can give birth to children with congenital toxoplasmosis only once. There are no known cases of mothers with congenital infected children giving birth to infected children in subsequent pregnancies.

Also, it is not known and it is difficult to investigate the relative frequency of post-natal toxoplasmosis cases through the consumption of infected raw meat or the ingestion of food contaminated with oocysts from cat faeces. Toxoplasmosis is frequent in animals whose meat is intended for human consumption. The most commonly affected species in the world are sheep, suina and rabbits. Infections in cattle have a lower prevalence than in sheep or pigs. Toxoplasmosis is also frequently reported in wild animals, especially cervids and bears. *Toxoplasma gondii* cysts survive in the tissues of animals for consumption for many years. Man can be infected by eating raw or undercooked meat.

*Toxoplasma gondii* from meat is destroyed by extreme temperatures. Tissue cysts are destroyed at temperatures above 67 degrees Celsius and minus 13 degrees Celsius, as well as when exposed to gamma radiation above 0.5 kGy.

To prevent infections in cats, they should never be fed with raw meat, organs or bones, and efforts must be made to keep them in the house, preventing them from hunting. Trash cans should always be covered to prevent consumption of household waste, corpses etc.

Cats near farms must be castrated to keep under control the feline population. Dead animals should be immediately isolated to prevent pig cannibalism and necrosis in cats.

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