Toxoplasmosis in cats at Kabacan, Cotabato, Philippines

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Abstract

The study was conducted to detect *Toxoplasma gondii* in cats by measuring the level of antibodies in the blood using the rapid ImmunoCombR feline *T. gondii* antibody test kit. Confirmation was done through fecal, blood smear, and histopathological examinations of biopsied mice. Out of the 36 cats that were sampled 12 (33.33%) gave positive results, seven (19.44%) had high positive results, and 17 (47.22%) were negative. Cats that yielded high positive reaction demonstrated tachyzoites in their blood. Bradyzoites were also seen from mouse brain tissue following bioassay of spleen tissue of high positive-reacting cats. The current results indicate that *T. gondii* is present among cats in Kabacan, Cotabato, Philippines and may be a potential risk to other susceptible animals in the area especially humans.

Key words: animal diseases, diagnostic test kit, histopathology, household pets, protozoan parasites

Introduction

Toxoplasmosis is an important disease and is considered one of the most common zoonoses occurring worldwide. *Toxoplasma gondii*, the causative agent of the disease causes abortion in pregnant women infected primarily during the first trimester of pregnancy. It is also one of the most common causes of abortions in sheep and goats (Blood and Henderson 1975).

No population is exempt from the possibility of contacting *T. gondii* considering that this protozoan parasite could be harbored by a large variety of animals which may serve as potential medium for the transmission of toxoplasmosis among the populations (Zeibig1997). Cats are the definitive hosts of the parasite and they eliminate oocysts in the faeces; these oocysts are the infective forms to the non-feline hosts including humans (Ancha and Szyfres 2003).

In Kabacan, Cotabato, cats are one common household pets hence people usually keep close contact with these animals. No reports yet have been documented regarding the status of household cats in the said area with regards to toxoplasmosis hence there is no information whether *T. gondii* is present or not in the locality and if there is a possibility that these cats could transmit the infection to humans and other susceptible animals. It is the aim of this study to detect the presence of *T. gondii* among cats by measuring the level of antibody in their blood using a *T. gondii* antibody test kit (Biogal Galed Laboratories, Israel). The presence of detectable levels of antibodies in these cats would indicate that these cats are infected or have become immune following exposure to the parasite.

Materials and Methods

Thirty-six cats were selected from the households of Kabacan, Cotabato. Blood was collected from these cats and tested using the commercial serological diagnostic kit (ImmunoCombR feline *Toxoplasma gondii* antibody test kit) (Biogal Galed Laboratories). The antibody levels from the blood were read and interpreted as negative, suspicious, positive, and high positive based on the CombScale apparatus provided in the kit. Confirmation through fecal examination, demonstration of the organism in blood smear, and histopathology were done with the high positive results. Fecal examination was done through flotation technique and demonstration of the organism through examination of blood smear stained with hemaquick stain (Medic Laboratories). A bioassay of spleen tissue into mice was done adopting the procedure of Dubey (1994). These mice were inspected daily for febrile response that indicated acute toxoplasmosis. Mice showing this reaction were culled and necropsied and their brain processed for histopathological examination.
Results

From the 36 samples tested, 17 (47.22%) showed negative reaction, 12 (33.33%) had positive reaction and seven (19.44%) showed high positive reaction to the test. No samples reacted suspiciously (Fig 1).

![Graph showing test reactions of cats to Immunocomb Toxoplasma gondii antibody test.](image)

**Fig 1. Test reactions of cats to Immunocomb Toxoplasma gondii antibody test.**

Oocysts were not observed from the feces of cats with high positive reaction but tachyzoites were seen from their stained blood smear (Fig 2). On histopathology, brain cysts were demonstrated in mice which were inoculated with spleen tissue of cats with high positive results (Fig 3).

![Image of tachyzoites in blood smear.](image)

**Fig 2. Tachyzoites (arrow) in blood smear of cat with high positive reaction to Immunocomb T. gondii antibody test (Hemaquick stain 400X).**

![Image of brain cyst from mouse inoculated with tissue from a cat with high positive reaction.](image)

**Fig 3. Brain cyst (bradyzoite) from a mouse inoculated with tissue from a cat with high positive reaction (400X).**

The kit also specifies that positive results are equivalent to a titer of 32 to 64 which usually indicates past inactive infection. Twelve (33.33%) of the samples had positive reaction suggesting that the cats from which these samples were taken were previously exposed to the infection and were able to maintain a protective level of antibodies. Meanwhile, seven (19.44%) of the cats had high positive results. These cats serologically confirmed a current *T. gondii* infection. As specified in the kit, cats with this reaction are considered immune.

The possible factors which could have influenced the presence of the infection in the locality include the environment, feeding habits or management, weather condition, sanitation, and the presence of other cats in the locality (Schmidt et al 2000). Cats which can hunt or are fed uncooked food are more likely to be infected than those which are usually kept indoors and fed processed food (Frenzel 1974). In the present study, most of the cats that were tested, although domesticated, were still free to roam in the environment hence they could have uncontrolled feeding. Cats are also numerous in the area and sanitation is generally poor and the climate is mild and humid. A humid environment is considered favorable for the survival of oocysts of *T. gondii* for long period (Neva and Brown1994).

Cats with negative reaction are considered susceptible and when infected they will eventually shed oocysts (Biogal Galed Laboratories 2003) hence comprising a risk to people particularly pregnant women. Cats with antibodies are likely to be resistant to infection and, hence, are safer pets (Beaver et al 1984). Cats with positive and high positive reactions do not shed the oocysts except when the animals...
are immunocompromised (Ettinger 1989). Thus serologically positive cats may comprise a lesser danger than serologically negative cats.

Cats with high positive results had no oocysts in their faeces. This result implies that oocysts production has ceased at the time when these animals developed antibodies since infected cats usually shed oocysts for less than two weeks and cease to excrete oocysts when they develop immunity (Kirk 1974). When these same cats will be stressed and immunocompromised because of a debilitating disease or drugs, shedding of infective oocysts may recur (Ettinger 1989).

The demonstration of tachyzoites in the blood of cats and brain cysts or bradyzoites in inoculated mice confirms the serological result and indicates that *T. gondii* infection is present among the cat populace in Kabacan, Cotabato. This also showed that the Immunocomb *T. gondii* test is a sensitive tool to detect current and active infection with *T. gondii* in cats.

**Conclusion**

Toxoplasma gondii is present among cats in Kabacan, Cotabato as detected by an antibody test kit. This poses a health hazard as the infection in cats could be disseminated to humans hence awareness among the human populace is important especially among cat owners. A bigger study with increased number of samples is recommended to obtain sufficient information regarding the prevalence of *T. gondii* infection in the locality.

**References**


