A Novel Multiplex Immunoassay to Detect Acute Cytauxzoonosis in Domestic Cats

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Background

- *Cytauxzoon felis* is a tick-borne apicomplexan parasite that causes fatal disease in domestic cats (*Felis catus*)
- The definitive host of *C. felis* is the Lone Star Tick (*Amblyomma americanum*); Intermediate hosts are Bobcats and domestic cats
- Onset of severe clinical signs may occur as early as 7 days post infection
- Current detection methods of *C. felis* include microscopic detection of piroplasms and PCR testing of whole blood

With current detection methodologies, *C. felis* is undetectable until ≥ 14 days post infection
- IgM antibodies play an important role in early immunity, and are the first antibodies elicited in an immune response following infection

Objectives

- To determine if detection of *C. felis*-specific IgM antibodies during acute infection would allow for earlier diagnosis of cytauxzoonosis than currently available methodologies

Materials and Methods

- A multiplex immunoassay was developed to detect IgM antibodies to two different *C. felis* surface-antigen recombinant proteins (rProteins); cf76 and contig88
- rProteins were conjugated to magnetic microsphere beads and incubated with serum samples from cats at day 0, 7, 10, 11, 14 and 18 post-infection with *C. felis*
- An anti-cat IgM and an anti-cat IgG detection antibody was used to detect median fluorescent intensity (MFI)
- Relative antibody concentrations were measured using the Bioplex 200 system

Results

IgM is detectable at day 11 p.i.

- IgM is detected in 3/4 cats on days 11 and 14 p.i.
- All 4 cats have significantly increased IgM at day 18 p.i.

IgG is detectable at day 14 p.i.

- IgG is detected in 3/4 cats on day 14 p.i., and all 4 cats by day 18 p.i.

Conclusions

- Although *C. felis*-specific IgM antibodies were reliably detected by MIA, they were not detected until 14 days post-infection.
- IgG was also detected during acute infection, but later than IgM
- These results may allow for the development of practical clinical applications to aid in the early detection and treatment of cytauxzoonosis in the future.

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