Diagnostic update

Faecal Dx antigen testing has been expanded to include *Cystoisospora* spp. detection.

To ensure the health of patients, a faecal examination for intestinal parasites is an important part of routine wellness care as well as those with gastrointestinal disease.

Regardless of the faecal procedure used, there can be some limitations on accurately identifying infections with some parasites. Detection of common parasites can be difficult with the current diagnostics. IDEXX Reference Laboratories offers Faecal Dx* antigen testing as an additional tool for detecting these parasites. With the addition of *Cystoisospora* spp. antigen detection (formerly known as *Isospora*), Faecal Dx profiles now provide more accurate detection of the most common and clinically relevant intestinal parasites.

Background

In small-animal practice, nematodes, cestodes and coccidian protozoa are commonly encountered intestinal parasites in canine and feline patients. They each have a unique life cycle, and their prepatent period, the time in which they infect a host before laying eggs or oocysts seen in the faeces, is unique to each parasite. This prepatent period may allow infections to go undetected on faecal flotation testing, increasing the chance for the appearance of clinical signs prior to evidence of eggs, oocysts, or proglottids in the stool. The prepatent period is 4–13 days for most species of *Cystoisospora* in dogs and cats.[1] *Cystoisospora* spp. can cause coccidiosis in both dogs and cats.[2]

Prevalence

Infections are considered common in both dogs and cats less than 6 months of age, with various studies indicating presence in 0.2 %–22.6 % of dogs and 1.9 %–28.1 % of cats in Europe, depending on the age group and population tested.[3]

Two publications assessing IDEXX faecal testing over a 3-year period determined that *Cystoisospora* is found in 1.6 % of dogs and 2.2 % of cats presented for wellness visit, with positive results most commonly found in puppies and kittens less than 6 months of age.[4,5]

Clinical signs

Healthy adult dogs and cats may be infected and show no clinical signs. Clinical signs are more likely in young, immunocompromised and/or stressed patients and include diarrhea, weight loss, dehydration, hemorrhage, vomiting, depression and anorexia.[2]

Infections left untreated can be potentially fatal. Infections usually occur at 3–8 weeks of age, with the majority of clinical cases diagnosed in puppies/kittens less than 4 months old.[2] In immunocompetent adult animals, infection very rarely causes disease. Adults may shed oocysts for a few days and have no clinical signs.[1]

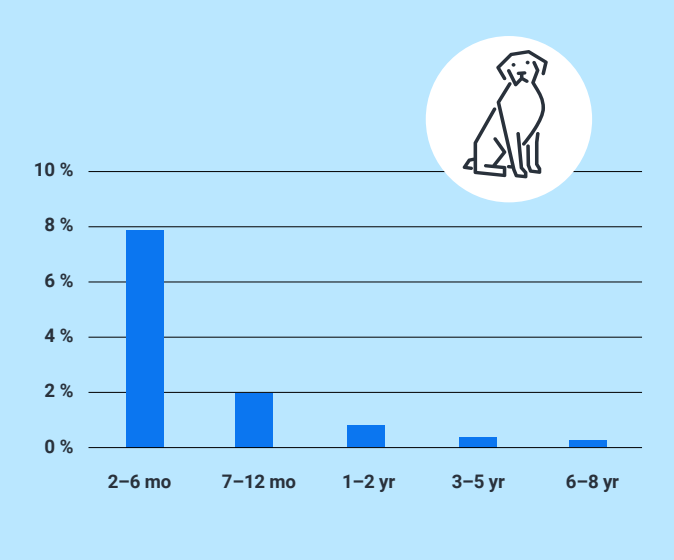

Figure 1. Canine *Cystoisospora* spp. positivity by faecal flotation testing.[4]

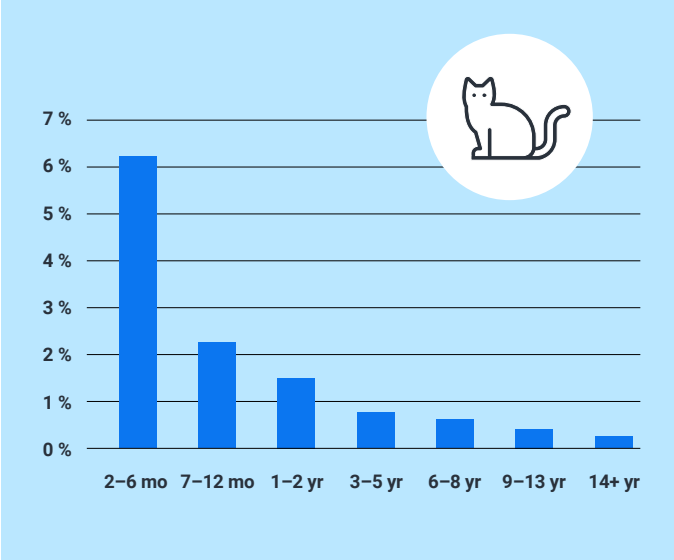

Figure 2. Feline *Cystoisospora* spp. positivity by faecal flotation testing.[5]

Figure 3. *Cystoisospora* life cycle.

Current diagnostics[1]

Historically, diagnosis of canine and feline coccidiosis is based on signalment, history, clinical signs, and the oocysts present in faeces. Faecal examination should be performed using centrifugal flotation and a sufficient volume of faeces. The presence of oocysts in faeces alone is not proof that coccidiosis is the cause of clinical signs. Oocysts of *Eimeria* spp. are sometimes observed in canine faecal samples because of coprophagy of avian, rabbit, rodent, or ruminant faeces. Dogs and cats are not hosts to *Eimeria* spp. These oocysts are referred to as pseudoparasites (gastroinstestinal pass-through organisms). Sporulated oocysts of *Eimeria* spp. often exhibit the general features of the genus with 4 sporocysts, each with 2 sporozoites, whereas the sporulated oocysts of *Cystoisospora* contain 2 sporocysts with 4 sporozoites each (*Isospora*-type). Additionally, oocysts of many *Eimeria* spp. often have oocyst wall ornamentations called micropyles or micropyle caps.

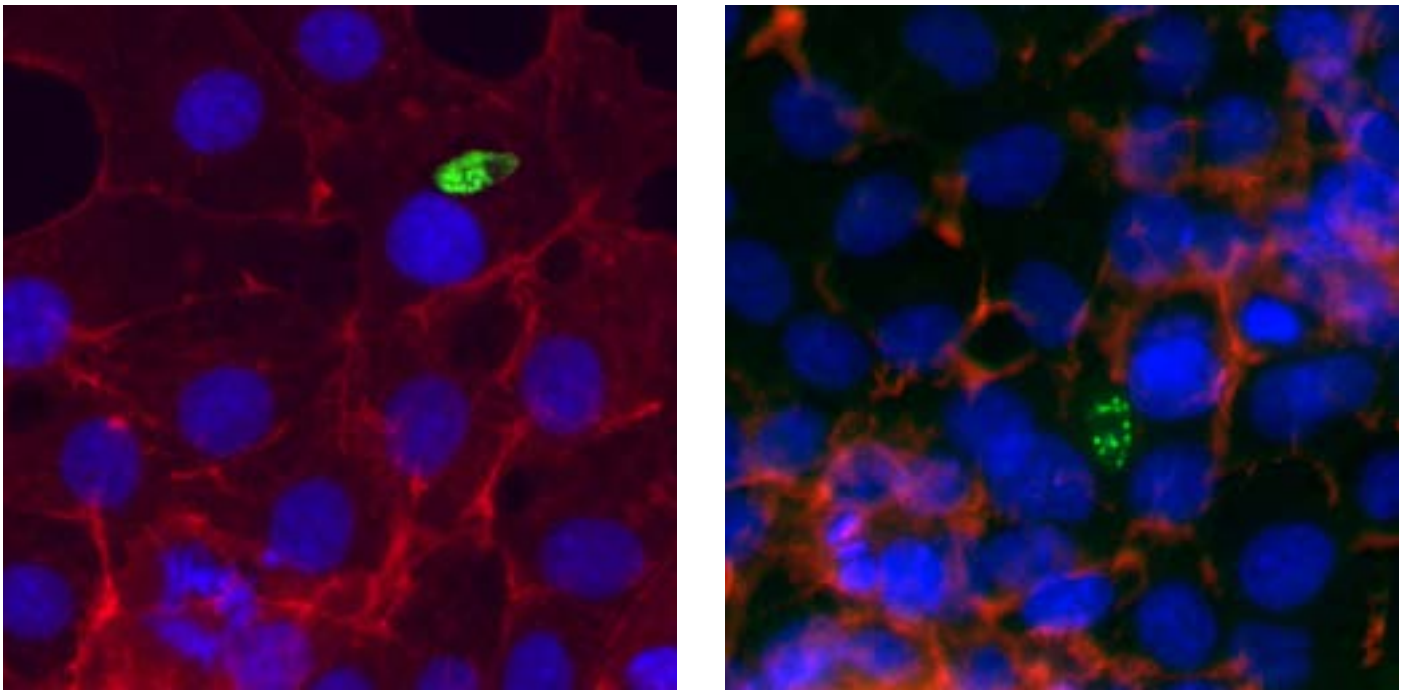

Figure 4. Immunofluorescent images of *Cystoisospora*-infected canine cell model at 3 days postinfection. Shown in green are antigen-positive *Cystoisospora* sporozoites embedded in canine cells. Cultures were counterstained to show cytoskeletal architecture in red and nuclei in blue.

Testing innovations

With the addition of *Cystoisospora* antigen to Faecal Dx* panels and profiles, detection does not depend on the presence of oocysts in the faeces. The coproantigen is detected from sporozoites, merozoites and oocysts in canine and feline faecal samples. The coproantigen is specific to pathogenic *Cystoisospora* spp. of both dogs and cats, including *C. canis*, *C. ohioensis* complex, *C. felis* and *C. rivolta*. It does not cross-react with *Eimeria* spp., which can be commonly found in faeces as a result of coprophagy.

In 86,836 faecal samples submitted to IDEXX Reference Laboratories over a 2-week period, 2.7 % were positive for antigen, while only 1.0% were positive for *Cystoisospora* oocysts by faecal flotation. The presence of antigen shows 89 % (86 %–91 % CI) positive and 98 % (98.05 %–98.24 % CI) negative agreement with faecal flotation. Based on seasonal trends, we would expect approximately 2.6 %–3.7 % of samples to be antigen positive.[7] As with faecal flotation, we see more than 8.0 % positivity in dogs and cats less than 6 months of age, with positive results much less common in older pets.

Treatment

Sulfadimethoxine is one drug that is label approved for treatment of disease in dogs and cats in an early stage of infection associated with coccidiosis and selected enteropathogenic bacteria. Another drug registered for the treatment of *C. canis* and *C. ohioensis* complex in combination with an anthelminthic drug (emodepside) is toltrazuril. A number of drugs that have coccidiocidal activity are approved in other species, and they have been shown to be effective in dogs and cats when used extra label, including ponazuril and diclazuril.[2] In addition to treatment, appropriate sanitation is helpful in preventing spread of coccidiosis in kennels and catteries. Oocysts sporulate quickly in the environment, and daily removal of faeces can aid in the prevention of coccidiosis. Treatment of all infected in-contact animals may also be beneficial in controlling coccidiosis in kennels. Prevention of predation should be emphasized to prevent infection via ingestion of infected tissue from paratenic hosts.[1]

References

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