IDEXX LABORATORIES

DIAGNOSTIC UPDATE

IDEXX Reference Laboratories • January 2015

The Next Generation of Fecal Testing—Whipworm Antigen Testing

Introduction

In order to ensure the health of our patients, a fecal examination for intestinal parasites is an important part of a regular checkup. Regardless of the fecal procedure used, there can be limitations on accurately identifying infections with some parasites. The whipworm, *Trichuris vulpis*, is one parasite that can be a difficult to detect, and now IDEXX Reference Laboratories has added whipworm antigen testing as an additional tool for diagnosing this challenging parasite.

Background

Whipworm infections occur primarily in canids (dog, fox and coyote) and rarely in felids. The life cycle is direct, with infection occurring after ingestion of embryonated eggs previously shed in infected feces. In the environment, the eggs may survive for years and are very resistant to desiccation, extremes in temperature and ultraviolet radiation, making it a challenging parasite to eradicate from contaminated environments. Once the larvae hatch from the embryonated eggs in the small intestine, there is a lengthy prepatent period of 74–90 days before maturation into adult worms, which eventually reside in the cecum and adjacent large intestine. This lengthy prepatent period may allow infections to go undetected on fecal flotation for a longer period of time than other nematodes, thus increasing the chance for the appearance of clinical signs prior to evidence of eggs in the stool.

Prevalence

The prevalence of whipworm infections can vary. The whipworm prevalence in the U.S., based on detection of eggs in feces, ranges from 1.2% in pet dogs[1] to 14.3% in shelter dogs.[2]

Clinical Signs

Many dogs with whipworm infections may be asymptomatic, but others may develop colitis with mucus and/or fresh blood in their stool. More severe clinical signs include bloody diarrhea, weight loss, dehydration, anemia and occasionally death.

Rarely dogs will develop hyponatremia, hyperkalemia, prerenal azotemia and metabolic acidosis, which may often be confused with hypoadrenocorticism.[3–5]

Current Diagnostics

Currently, the most common method for diagnosing whipworm infection is fecal flotation, either passive or by centrifugation. Whipworm eggs are ovoid with prominent bipolar plugs and can be confused with capillarid eggs. There are many other issues that can complicate the diagnosis of whipworms by using this method. The first being that the eggs are denser than most other common intestinal parasites, and current passive flotation methods may not be adequate to recover these eggs. Secondly, as a result of the long prepatent period, dogs may develop clinical signs prior to shedding eggs. Lastly, intermittent shedding of eggs can lead to false-negative diagnoses if only a single fecal flotation preparation is examined.

New Testing Option from IDEXX Reference Laboratories

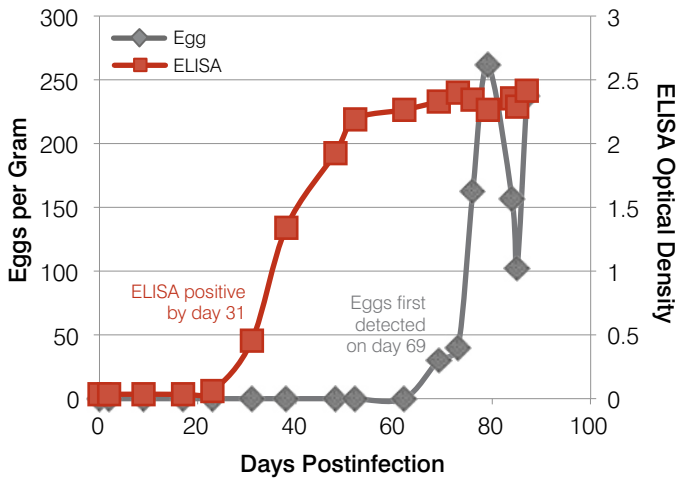
Antigen detection is commonly used today to diagnose heartworm and *Giardia* infections. An enzyme-linked immunosorbent assay (ELISA) for the detection of whipworm antigens in feces is now available through IDEXX Reference Laboratories Canada. The whipworm antigen is secreted from adult whipworms and is not present in whipworm eggs, thus allowing for detection of prepatent stages and overcoming the challenges of intermittent egg laying.

Detect More Infections

In a population of 4,240 canine fecal specimens submitted for ova and parasite (O&P) testing at IDEXX Reference Laboratories, whipworm eggs were detected in 42 (1%) of the specimens. The whipworm-specific antigen ELISA was positive in an additional 1.4% of specimens that were negative for whipworm eggs by the fecal O&P test, thus bringing the total whipworm detection with the combined O&P and ELISA testing to 2.4%.

Detect Infections Earlier

Because of the lengthy prepatent period of 74–90 days, many whipworm infections may go undetected for a period of time and therefore create a difficulty correlating clinical signs. In an experimental infection study, the whipworm antigen ELISA was able to detect infection during this prepatent stage (see graph next page).[6]



Treatment

There are a variety of anthelmintic products available for both treatment and control of whipworm infections. Treatment should be repeated monthly for at least 3 months because of the parasite's lengthy prepatent period and because reinfection is common. Both fenbendazole and febantel are common parasiticides used for the treatment of whipworm infections. The recommended dose is 50 mg/kg given daily for 3 days.[7] Milbemycin oxime and moxidectin, common ingredients in monthly heartworm preventives, are also effective in removing and controlling whipworms.[8,9]

Public Health Considerations and Preventive Measures

T. vulpis has low zoonotic potential, but it does occasionally infect humans.

The immediate disposal of feces is important to prevent environmental contamination and reduce the likelihood of reinfection. Because of the stable nature of the eggs, they are very difficult to destroy and may survive for many years in the environment. Monthly anthelmintic medications may be helpful in preventing the continuation of the cycle.

Ordering Information

test code	test name and contents
OPP	**Fecal Ova & Parasites Plus Panel** Fecal ova and parasites, *Giardia* antigen by ELISA, reflex whipworm antigen by ELISA if indicated
OPW	**Fecal Ova & Parasites with Reflex Whipworm Antigen** Fecal ova and parasites, reflex whipworm antigen by ELISA if indicated

Note: Specimens submitted in SAF or other preservatives are unsuitable for whipworm antigen ELISA testing.

Specimen requirements: 3–5 g fresh feces in a clean, plastic container (no SAF)

Turnaround time: 2–3 working days

Contacting IDEXX

Laboratory Customer Support

If you have any questions regarding test codes, turnaround times or pricing, please contact our Laboratory Customer Support Team at 1-800-667-3411, option 1, option 1.

Expert Feedback When You Need It

Our team of internal medicine specialists is available for complimentary consultation. Please call 1-800-667-3411, option 1, option 3, if you have questions.

Recommended Reading

Traversa D. Are we paying too much attention to cardio-pulmonary nematodes and neglecting old-fashioned worms like *Trichuris vulpis*? Parasites & Vectors. 2011;4:32. www.parasitesandvectors.com /content/4/1/32. Published March 8, 2011. Accessed December 18, 2013.

Gates MC, Nolan TJ. Endoparasite prevalence and recurrence across different age groups of dogs and cats. *Vet Parasitol*. 2009;166(1–2): 153–158.

References

1. Little SE, Johnson EM, Lewis D, et al. Prevalence of intestinal parasites in pet dogs in the United States. *Vet Parasitol.* 2009;166(1–2):144–152.
2. Blagburn BL, Lindsay DS, Vaughan JL, et al. Prevalence of canine parasites based on fecal flotation. *Compend Contin Educ Pract Vet.* 1996;18(5):483–509.
3. Cooper R. Whipworm in a dog: Could it be more? *Clin Brief.* April 2013;11(4):81–83.
4. Graves TK, Schall WD, Refsal K, Nachreiner RF. Basal and ACTH-stimulated plasma aldosterone concentrations are normal or increased in dogs with trichuriasis-associated pseudohypoadrenocorticism. *J Vet Intern Med.* 1994;8(4):287–289.
5. DiBartola SP, Johnson SE, Davenport DJ, et al. Clinicopathologic findings resembling hypoadrenocotticsm in dogs with primary gastrointestinal disease. *JAVMA*. 1985;187(1):60–63.
6. Elsemore DA, Geng J, Flynn L, et al. Enzyme-linked immunosorbent assay for coproantigen detection of *Trichuris vulpis* in dogs. *J Vet Diagn Invest*. 2014;26(3):404–411.
7. Companion Animal Parasite Council. Current advice on parasite control: intestinal parasites—whipworms. www.capcvet.org/capc-recommendations/whipworms#treatment. Published March 2013. Accessed December 18, 2013.
8. Bowman DD. *Georgis' Parasitology for Veterinarians.* 9th ed. St Louis, MO: Saunders; 2009:224.
9. Bowman DD, Legg W, Stanfield DG. Efficacy of moxidectin 6-month injectable and milbemycin oxime/lufenuron tablets against naturally acquired *Toxocara canis* infections in dogs. *Vet Ther.* 2002;3(3): 281–285.

The information contained herein is intended to provide general guidance only. As with any diagnosis or treatment, you should use clinical discretion with each patient based on a complete evaluation of the patient, including history, physical presentation and complete laboratory data. With respect to any drug therapy or monitoring program, you should refer to product inserts for a complete description of dosages, indications, interactions and cautions.

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