The SNAP Giardia Test provides sensitive and specific detection of Giardia antigen in dogs

Study shows the VetScan, Witness, and Anigen Giardia tests demonstrate poor sensitivity and specificity for Giardia antigen

Introduction

Giardia is a single-celled protozoan parasite that causes intestinal infections in both dogs and cats. Dogs become infected when they ingest Giardia cysts that may be present in water or other areas of the environment that have been contaminated with feces.1

Symptoms are more visible in puppies and younger dogs than in older dogs and can be acute, transient, intermittent, or chronic in nature. In some cases, dogs will exhibit diarrhea that is soft, frothy, greasy, and with a strong odor or excessive mucus.2

Rapid diagnosis of giardiasis in dogs with diarrhea is very important and several in-clinic tests are available to detect Giardia-specific antigens in the feces. However, a direct comparison of the sensitivity and specificity for antigen detection between these different tests has not yet been performed.

IDEXX Laboratories conducted a study to determine the performance of four in-clinic diagnostic tests for detection of Giardia antigen in canine feces: the SNAP® Giardia Test, the VetScan® Giardia Rapid Test (Abaxis), the Witness® Giardia Test (Zoetis), and the Anigen® Rapid CPV/CCV/Giardia Test (BioNote).

Study design

Study samples were sourced from fecal samples submitted to IDEXX Reference Laboratories for ova and parasites testing using centrifugal flotation that included identification of Giardia cysts. They were further tested for Giardia-specific antigen using the Thermo Scientific™ ProSpecT™ Giardia Microplate Assay.

Because discordant results between testing for cysts and antigen are possible, positive samples were defined as those testing positive by both reference methods while negative samples were defined as those testing negative on both reference methods. A total of 95 positive samples and 81 negative samples were identified. These samples were then tested using the four in-clinic tests following manufacturers’ protocols. For calculation of sensitivity and specificity, test results were compared to the results obtained by the reference methods.

Results

<table>
<thead>
<tr>
<th>In-clinic test</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP Giardia Test</td>
<td>89.2%</td>
<td>100%</td>
</tr>
<tr>
<td>VetScan Canine Giardia Rapid Test</td>
<td>71.0%</td>
<td>83.1%</td>
</tr>
<tr>
<td>Witness Giardia Test</td>
<td>63.7%</td>
<td>86.8%</td>
</tr>
<tr>
<td>Anigen Rapid CPV/CCV/Giardia Test</td>
<td>78.5%</td>
<td>70.1%</td>
</tr>
</tbody>
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Table 1. Comparative performance of in-clinic Giardia antigen test kits

The performance of all four in-clinic tests is shown in Table 1. The SNAP Giardia Test had higher sensitivity and specificity than any of the other three tests.

In addition, the VetScan Canine Giardia Rapid Test produced invalid results on 6 samples for failing to develop positive control line (representative images shown in Figure 1). One of them also failed on the Witness Giardia Test. These 6 samples were excluded from calculation of sensitivity and specificity, even though all had valid results by the SNAP Giardia Test and the Anigen test.

Summary and conclusions

• The Witness test missed nearly 4 in 10 samples that were positive for the presence of both Giardia cysts and Giardia-specific antigens; the VetScan test missed nearly 3 in 10; the Anigen test missed 2 in 10.
• The Witness, VetScan, and Anigen tests also incorrectly identified 13–30% of Giardia cyst-free and Giardia antigen-free dogs as positive.
• The Abaxis VetScan Canine Giardia Rapid Test was found to be prone to having invalid test results.
• Poor-performing Giardia tests could lead to misdiagnosis and delay the initiation of appropriate therapy in a dog with diarrhea caused by giardiasis.
• IDEXX ELISA-based tests have proven accuracy in the field for nearly 20 years and continue to demonstrate superior accuracy in the veterinary practice.

References