

The SNAP® 4Dx® Plus Test provides sensitive and specific detection of tick-borne diseases



Abaxis® VetScan® Canine Ehrlichia Rapid Test demonstrates poor sensitivity compared to reference methods

Introduction

Tick-borne diseases, including Lyme disease, ehrlichiosis, and anaplasmosis, are increasingly prevalent worldwide, as tick distributions expand through climate change, wildlife migration, and increased international travel of companion animals. Dogs and humans are both susceptible. In fact, detection of specific tick-borne diseases in dogs is generally recognized as a sentinel indicator of regional disease risk for humans. Sensitive detection of tick-borne diseases, including coinfections and multiple infections, in dogs is, therefore, both diagnostically important for veterinarians and epidemiologically important for public health.

Since 2001, IDEXX Laboratories has been the world leader in tick-borne disease testing by offering generations of high-quality diagnostic products (SNAP® 3Dx® Test, SNAP® 4Dx® Test, and SNAP® 4Dx® Plus Test). The latest version, the SNAP® 4Dx® Plus Test, detects antibodies produced by five pathogens, which include *Anaplasma phagocytophilum*, *Anaplasma platys*, *Borrelia burgdorferi* (Lyme disease), *Ehrlichia canis*, and *Ehrlichia ewingii*, in addition to detection of heartworm antigen.¹

Recently, Abaxis developed the VetScan® Canine Ehrlichia Rapid Test with product claims for detection of antibodies to *Ehrlichia canis*, *Ehrlichia ewingii*, and *Ehrlichia chaffeensis*. This is a single test for antibody detection to *Ehrlichia* only and does not detect antibodies to other pathogens as does the SNAP 4Dx Plus Test.

Study design

To evaluate sensitivity and specificity of the VetScan Canine Ehrlichia Rapid Test for the detection of antibodies to *E. canis*, *E. ewingii* and *E. chaffeensis*, canine samples were sourced from different regions in the United States.

Samples were first tested by a combination of reference methods that included the immunofluorescence assay (IFA) and species-specific recombinant antigen-based ELISA for *E. ewingii* and *E. chaffeensis* antibodies.^{2,3} *E. ewingii* or *E. chaffeensis* samples selected were monospecific infection samples. This was necessary to evaluate the performance of both assays because neither assay differentiates between pathogens—the presence of antibody to any of the three *Ehrlichia* species will give a positive test result.

Organism (number of samples)	VetScan® Canine Ehrlichia Rapid Test	SNAP® 4Dx® Plus Test	Reference test
	Sensitivity		
<i>E. canis</i> (30)	93%	100%	IFA
<i>E. ewingii</i> (52)	60%	92%	ELISA ²
<i>E. chaffeensis</i> (29)	41%	69%	ELISA ²

Table 1: Comparative performance of in-clinic *Ehrlichia* antibody tests



SNAP® 4Dx® Plus Test



VetScan® Canine Ehrlichia
Rapid Test

Samples were tested on the VetScan Canine Ehrlichia Rapid Test and the SNAP 4Dx Plus Test following manufacturers' instructions. The test results were compared to reference method results for calculation of sensitivity (table 1).

Conclusion

The IDEXX SNAP 4Dx Plus Test was substantially more sensitive than the Abaxis VetScan Canine Ehrlichia Rapid Test. In this population of 111 *Ehrlichia*-infected dogs, the SNAP 4Dx Plus Test identified more positive dogs than the VetScan Canine Ehrlichia Rapid Test.

The VetScan Canine Ehrlichia Rapid Test demonstrated low sensitivity overall, due in part to its very poor sensitivity for *E. ewingii* (60%) and *E. chaffeensis* (41%). These conclusions are consistent with those presented at the 27th Meeting of the American Society for Rickettsiology, June 20–23, 2015.⁴

These findings are significant because in the United States, *E. ewingii* and *E. chaffeensis* are nearly fourfold more common than *E. canis*, so the VetScan Canine Ehrlichia Rapid Test will miss nearly half (49.5%) of ehrlichial infections.

References

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