Comparative evaluation of Vcheck M Babeisa gibsoni/canis with Real-time PCR

Key Words : Vcheck M, *Babsia gibsoni*, *Babesia canis*, Real-time PCR, Sequencing

Introduction

B. gibsoni and *B. canis* are protozoan parasites that are transmitted to dogs by ticks and are the causative agents of Canine Babesiosis. They are important tick-borne diseases with a worldwide distribution. They can cause a variety of symptoms from a sudden collapse with systemic shock, hemolytic crisis to a subtle and slowly progressing infection with no apparent clinical signs.

The veterinarian usually uses blood smears, serologic tests, and PCR tests to diagnose Babesiosis. In the past, PCR test samples had to be sent to an outside laboratory, but with the Vcheck M, PCR testing is possible in the veterinary clinic.

Purpose

The goal of this study is to evaluate the diagnostic sensitivity and specificity of the newly developed Vcheck M Babesia gibsoni/canis (POCT PCR kit) to laboratory-based real-time PCR.

Additionally, if there are discrepancies between the Vcheck M and lab-based real-time PCR results, sequencing will be requested to an external laboratory to confirm the final result.

Materials and Methods

Vcheck M tests were performed at SD Biosensor Inc., MDx R&D department.
Additionally, the sequencing tests were requested to the 'B' Laboratory (Korea) for confirmation.

The samples were a total of 60 canine whole blood checked positive by lab-based real-time PCR at a veterinary commercial laboratory (Korea).

Results

The test results for the comparison of Vcheck M and lab-based real-time PCR are described in Tables 1, 2, and 3.

Conclusion

In this study, there was a discrepancy between Vcheck M and lab-based real-time PCR occurred (Vcheck M *B. canis* positive).

B. canis had never been reported in Korea, so this dog was naturally assumed to be infected with *B. gibsoni* infection. However, this sample was confirmed to *B. canis* infection by sequencing. This was the first report of *B. canis* in Korea.

Based on the results, it was confirmed that Vcheck M Babesia gibsoni/canis is superior to existing lab-based PCR in terms of not only convenience but also clinical performance.

Babesia gibsoni		Reference method (Real-time PCR & seqeuncing)		
		Positive	**Negative**	**Total**
Vcheck M Babesia gibsoni/canis	**Positive**	54	0	54
	Negative	0	6	6
	Total	54	6	60
	Sensitivity	100% (54/54)		
	Specificity	100% (6/6)		

Babesia gibsoni		Reference method (Real-time PCR & seqeuncing)		
		Positive	**Negative**	**Total**
Lab-based real-time PCR	**Positive**	54	1	55
	Negative	0	5	5
	Total	54	6	60
	Sensitivity	100% (54/54)		
	Specificity	83.3 (5/6)		

Table. 1 Sensitivity and specificity of Vcheck M Babesia gibsoni/canis and existing lab-based real-time PCR for *B. gibsoni*

Babesia canis		Reference method (Real-time PCR & seqeuncing)		
		Positive	**Negative**	**Total**
Vcheck M Babesia gibsoni/canis	**Positive**	1	0	1
	Negative	0	59	59
	Total	1	59	60
	Sensitivity	100% (1/1)		
	Specificity	100% (59/59)		

Table. 2 Sensitivity and specificity of Vcheck M gibsoni/canis for *B. canis*

Sample No.				
	PCR Result (Laboratory)	**Vcheck M Result**		**Sequencing Result**
		B. gibsoni	***B. canis***	
5	*B. gibsoni* (+)	(-)	*B. canis* (+)	*B. canis* (+)

Table. 3 Sequencing result of the discrepant sample between Vcheck M and existing lab-based real-time PCR