

Comparison between the BioNote Vcheck CDV Antibody Kit and Another Commercial Antibody Test Kit for the Determination of Antibody Titer to Canine Distemper Virus

Key words: BioNote Vcheck, Canine Distemper virus, Antibody testing, Correlation

Summary

45 dog sera samples were used. All samples were tested by the Vcheck CDV Ab kit and "I" commercial canine antibody test kit. 7 samples were tested by VN test for canine Distemper Virus (CDV) Ab. Sensitivity of the Vcheck CDV Ab kit, in comparison to the "I" commercial canine antibody kit results, was 100%. The number of negative samples was insufficient to assess the specificity of Vcheck CDV Ab kit.

Introduction

Canine distemper virus (CDV) is recognized as important pathogen that cause illness and death in dogs especially puppies. Antibody testing for CDV has application for determining protective immunity in the puppy, for informing revaccination intervals in adult dogs and in management of infectious disease outbreaks in shelters. Low or negative test result indicate that the dog has little or no antibody, and that revaccination is recommended.

Virus Neutralization (VN) test is gold standard for detecting CDV Antibody (Ab). The test used in reference laboratories. Animals with titers below 24 should be assessed for a booster vaccination. But the test is relatively expensive and usually takes a few days.

"I" commercial canine Ab kit is designed to determine dog serum antibody titer to Infectious Canine Hepatitis, Canine Parvovirus and Canine Distemper Virus in-house. It has long been used as Ab test kit in veterinary clinics around the world.

The Vcheck CDV test kits are a new chromatographic immunoassay for the detection of Ab to canine distemper virus in canine serum, plasma. Purpose of this study is to evaluate accuracy of the Vcheck CDV Ab kit.

Materials and Methods

Samples: The 45 random canine serum (Equitech-Bio, Kerrville, TX) were used. All samples were tested by Vcheck CDV Ab kit and "I" commercial canine Ab kit. 7 samples were tested by VN test

Vcheck CDV Ab kit: the kits was used according to manufacturer's instructions (BioNote, Korea). Read the result on the device screen in 10 minutes. The V200 analyzer display the test result on the screen. Negative results indicate the absence of Ab to canine distemper virus. Low titer (1~2) indicate that antibody titer is low against canine distemper virus. Medium titer (3) indicate that antibody titer is medium against canine distemper virus and good immune status. High titer (4~6) indicate that antibody titer is high against canine distemper virus and excellent immune status.

"I" commercial canine Ab kit: The kits was used and interpreted according to manufacturer's instructions ("B" company). Compare the color tone of CDV test spots with the positive reference spot. A faint color tone of S1 or less is considered a negative result. A color tone that matches with S2 is considered a weak positive result. A color tone that is equal or darker than the reference spot is considered a positive response (scale score S3-S6).

VN test: 7 samples were tested to identify CDV Ab titer, including those of inconsistent result (sample no. 1). The test is performed in Cornell University in September, 2018. The VN antibody titer is the reciprocal of the highest dilution of serum that neutralizes the infectivity of the virus (endpoint dilution of 1:32 =antibody titer of 32).



Titers are in units of Ab and as such all values reported without modifiers contain that specified amount of antibody in the sample. Values with a < (less than symbol) indicate no detectable antibody at the minimum readable dilution (<4 = no detectable antibody at a 1:4 dilution).

The sensitivity will be calculated as follows:

Sensitivity (%) = 100 x (No. of serum samples with medium titer or high titer by Vcheck CDV kit / No. of serum samples with positive results by "I" commercial canine Ab kit)

Results

		"I" commercial kit		
		Pos	Neg	total
Vcheck CDV Ab	Pos	43	1	44
	Neg	0	1	1
total		43	2	45

Table 1: the summary of the correlation between the Vcheck CDV Ab and the "I" commercial canine Ab kits results.

"I" commercial kit Pos: positive results (scale score S3-S6), Neg: negative and weak positive results (scale score S0-S2). Vcheck CDV Ab Pos: medium or high titer results (3-6), Neg: negative or low titer results (0-2).

Sample No.	"I" commercial kit	Vcheck CDV Ab	VN test	Ab titer
13	S2	Low titer (1)	<4	Low
12	S3	Medium titer (3)	24	Medium
15	S5	High titer (4)	64	High
1	S2	High titer (5)	128	
2	S3	High titer (5)	256	
42	S3	High titer (6)	384	
48	S3	High titer (6)	384	

Table 2: "I" commercial canine Ab kit, Vcheck CDV Ab kit, and VN test results of 7 samples

Ab titer Low – "I" commercial kit scale score: S0-S2, Vcheck result: Negative (-) or Low titer 1-2

Medium - "I" commercial kit scale score: S3-S4, Vcheck result: Medium titer 3

High - "I" commercial kit scale score: S5-S6, Vcheck result: High titer 4-6

Ab titer is confirmed by VN test.

Discussion

Vcheck CDV Ab kits demonstrated great correlation to another commercial canine Ab kit. Sensitivity of the Vcheck CDV Ab kit, in comparison to the "I" commercial kit results, was 100%. Sample with inconsistent result (sample no. 1) was confirmed that the test result of Vcheck CDV Ab kit was accurate by gold standard method. For the samples tested with gold standard method, titer of the Vcheck CDV Ab test results were more correlate well with gold standard reference method.

"I" commercial canine shows high accuracy in several studies, but some results are inaccurate due to the tendency to vary depending on the experimenter as it is read visually. Since the results are read visually, it will also be difficult to determine the exact Ab titer. But Because Vcheck objectively analyzes the accurate CDV Ab titer results on the screen, the results do not vary depending on the experimenter.

Conclusion

The Vcheck CDV Ab kit provides accurate and precise Ab titer results against canine distemper virus in-house.