

Evaluation of Vcheck Feline Antibody Tests for the Detection of Protective Antibodies

Key Words: BIONOTE, Vcheck, FPV Ab, FHV Ab, FCV Ab, VN Test, HI Test

Introduction

Feline distemper, caused by feline panleukopenia virus (FPV), is a severe, highly contagious viral disease of cats. Feline calicivirus (FCV) and feline herpesvirus type 1 (FHV-1) are the two primary causes of upper respiratory disease in cats.¹ The core vaccines for the cat are those that protect against FPV, FHV-1, and FCV. The presence of antibodies in adult cats acquired through previous vaccination or exposure to field virus correlates with the protection against infection.² The FHV, FCV vaccines will not completely prevent an infection from occurring if a cat is exposed to the virus, but it will greatly reduce the severity of the infection.

The Vcheck FPV, FHV or FCV Ab Test is a one-step rapid test for the semi-quantitative detection of antibodies to panleukopenia virus, herpesvirus or calicivirus in feline serum or plasma. The purpose of this study is to verify the performance of the Vcheck compared to the gold standard test for FPV, FHV, and FCV antibody titers.

Materials and Methods

FPV Ab titer test:

A Total of 45 random feline serum samples were tested by Vcheck FPV Ab test kit according in accordance to the manufacturer's instructions (BioNote, Korea). The Vcheck result of medium (3, 3.5) or high titer (from 4 to 6) is considered having a 'high' protective antibody, while one of negative (0) or low titer (1, 2) is considered having a 'low' protective antibody. They were also referred to Cornell University College of Veterinary Medicine (CUCVM) for Hemagglutination Inhibition (HI) test and evaluated with a commercial in-practice test ('I' kit). A titer result of 1:80 or greater is considered as 'high'.

FHV Ab (FCV Ab) titer test:

A Total of 86 (75) random feline serum samples were tested by Vcheck FHV Ab (FCV Ab) test kit in accordance to the manufacturer's instructions. The Vcheck result of medium (3, 3.5) or high titer (from 4 to 6) is considered having a 'high' protective antibody, while one of negative (0) or low titer (1, 2) is considered having a 'low' protective antibody. They were also referred to CUCVM for Virus Neutralization (VN) test and evaluated with a commercial in-practice test ('I' kit). A titer result of 1:16 (1:32) or greater is considered as 'high'.

Results

The Vcheck antibody tests demonstrated higher sensitivities and specificities than or equal to a commercially available 'I' kit, compared against the reference tests; The FPV Ab Test showed 100% sensitivity and 95.2% specificity, FHV Ab Test 100 and 91.5%, FCV Ab Test 92.7 and 85.3%. On the contrary, 'I' kit had 100% sensitivity and 95.2% specificity in FPV Ab, 100 and 71.2% in FHV Ab, 92.7 and 79.4% in FCV Ab (Refer to Table 1, 2 and 3).

Conclusion

The findings of the present study indicated that the Vcheck showed higher correlation with the gold standard tests (HI, VN test) than or equal to a commercial product 'I', so it can be used as a useful method of serological testing due to its rapidity and ease of performance, providing accurate antibody titer results against FPV, FHV and FCV in-house.

Reference

1. WSAVA GUIDELINES FOR VACCINATION OF DOGS AND CATS, Journal of Small Animal Practice – Vol 57, January 2016
2. Lappin MR, Andrews J, Simpson D, et al. Use of serologic tests to predict resistance to feline herpesvirus 1, feline calicivirus, and feline parvovirus infection in cats. J Am Vet Med Assoc 2002; 220: 38–42.

Comparative Evaluation		Commercial 'I' kit		Total	Vcheck FPV Ab		Total
		High	Low		High	Low	
HI Test (Cornell Univ.)	High	24	0	24	24	0	24
	Low	1	20	21	1	20	21
Total		25	20	45	25	20	45
Sensitivity		100 % (24/24)			100 % (24/24)		
Specificity		95.2 % (20/21)			95.2 % (20/21)		
Overall Agreement		97.8 % (44/45)			97.8 % (44/45)		

Table 1. Correlation of Vcheck FPV Ab test and a commercial 'I' kit with HI test

Comparative Evaluation		Commercial 'I' kit		Total	Vcheck FHV Ab		Total
		High	Low		High	Low	
VN Test (Cornell Univ.)	High	27	0	27	27	0	27
	Low	17	42	59	5	54	59
Total		44	42	86	32	54	86
Sensitivity		100 % (27/27)			100% (27/27)		
Specificity		71.2 % (42/59)			91.5 % (54/59)		
Overall Agreement		80.2 % (69/86)			94.2 % (81/86)		

Table 2. Correlation of Vcheck FHV Ab test and a commercial 'I' kit with VN test

Comparative Evaluation		Commercial 'I' kit		Total	Vcheck FCV Ab		Total
		High	Low		High	Low	
VN Test (Cornell Univ.)	High	38	3	41	38	3	41
	Low	7	27	34	5	29	34
Total		45	30	75	43	32	75
Sensitivity		92.7 % (38/41)			92.7 % (38/41)		
Specificity		79.4 % (27/34)			85.3 % (29/34)		
Overall Agreement		86.7 % (65/75)			89.3 % (67/75)		

Table 3. Correlation of Vcheck FCV Ab test and a commercial 'I' kit with VN test