

Letter to the Editor

Evaluation of the agreement between allergen-specific intradermal or IgE serological tests and a point-of-care immunodot assay in dogs with atopic dermatitis

Dear Editor

To identify IgE-mediated hypersensitivity to environmental allergens for future implementation of allergen avoidance measures or allergen-specific immunotherapy, or to differentiate atopic dermatitis (AD) from atopic-like dermatitis (ALD), veterinarians have recourse to allergen-specific intradermal (IDT) or IgE serological tests (IST).¹ Unfortunately, as shown with experimental canine allergy models, the positivity of these tests can vary with the timing of exposure to offending allergens, even in dogs known to be hypersensitive to such allergens.² If an inexpensive in-clinic immunoassay were to correctly predict if IDT or IST would yield positive results, it could help selecting the appropriate time to perform these more expensive tests. In 2005, we reported that results obtained with a first generation point-of-care immunodot assay (Allercept E-Screen; Heska, Loveland, Colorado) were in good agreement with those of IDT and IST.³ Moreover, we demonstrated that, if these two tests were to have been performed only in dogs with positive results to the E-screen, then the probability of obtaining positive results on IST and IDT would have increased by more than 30% compared to tests done on all subjects.³

The objective of this study was to determine if a second-generation immunodot assay (Allercept E-Screen 2G-ES2G; Heska) would also be effective to predict results of IDT and IST in dogs with AD.

Forty-one dogs were diagnosed with AD based on standard methods. On the same day, IDT was performed using more than 50 single and low-number mixtures of allergens, and blood was collected and sent out for Heska's full panel Allercept IST or frozen until performance of ES2G. This second generation test is an in-clinic immunodot assay that has three spots that contain mixtures of either tree (T), grass + weeds (G + W) or indoor (I; mites + molds + flea) allergens.

Results of IDT, Allercept IST and ES2G were reported as 'positive' or 'negative' for T, GW and I allergen categories if at least one allergen triggered wheal formation in IDT, or if it had a value above or equal to 150 units in Allercept IST, or if there was any colour change in the corresponding allergen spot in ES2G.

Two-by-two contingency tables were generated to compare results of ES2G to those of IDT or IST. Rates of agreement and predictive values were determined using standard methods, while Cohen's Kappa coefficients

were also calculated to assess the concordance between results of ES2G and those of IDT or IST.

Parameters comparing results of ES2G and IDT or IST are found in Table 1. In summary, when all allergens were analyzed as a group, the ES2G generally had higher rates of concordance (i.e. observed agreement), predictive values and Kappa coefficients when compared to IST rather than IDT. When analyzed for each allergen mixture spots, the agreement between tests was strongest for the indoor allergen spot and weakest for the two pollen mixes.

The first generation of E-Screen was designed with only one allergen testing spot that contained a mixture of house dust mite, flea and pollen allergens. In this second-generation point-of-care test, allergens were divided in three separate spots as described above. Altogether, rates of observed agreement between the E-Screen tests and IDT results were lower with this second generation (71%) than with the first one (87%).³ Remarkably, the concordance rates were identical between both generations of E-Screens and IST results (i.e. 83%).³ This relatively lower rate of agreement between ES2G and IDT could be acceptable, when considering the advantage of being able to screen separately for IgE hypersensitivity for three allergen categories compared to a single one with the previous test.

In conclusion, results of the ES2G test appear to moderately or substantially agree with those of IDT or IST, respectively. Agreement was strongest for the indoor allergen spot, which contains the main allergen (*Demodex phagoides farinae*) for dogs, worldwide.⁴ As a result, there could be some value for veterinarians in completing the ES2G test prior to deciding whether or not to embark on performing IDT or collecting blood for IST.

Finally and importantly, readers are reminded that neither results of ES2G, IDT or IST can be used to substantiate the diagnosis of AD in dogs because of the high rate of positivity of IDT or IST in normal dogs. As recommended in recent practice guidelines,¹ the use of IDT or IST should be limited to the following situations: '(i) to document whether or not the disease is associated with allergen-specific IgE (i.e. determining whether the dog suffers from AD or ALD), (ii) to implement allergen-avoidance interventions (e.g. house dust mite elimination measures), and/or (iii) to select allergens to be included in immunotherapy preparations'.¹

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E-Screen 2 tests were provided free-of-charge by Heska, Switzerland.

Conflict of Interest

The authors have not received consulting nor lecturing honorarium from Heska in the last decade. Research

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Table 1. Comparison of results of E-Screen 2G and intradermal or serological tests

	Altogether	Trees	Weeds/Grasses	Indoors
ES2G versus IDT				
Positive predictive value	84%	80%	57%	89%
Negative predictive value	62%	76%	44%	100%
Observed agreement (OA)	71%	77%	46%	90%
Chance agreement (CA)	49%	64%	46%	77%
Kappa = (OA – CA)/(1 – CA)	0.43	0.35	0.00	0.55
Agreement interpretation	Moderate	Fair	Poor	Moderate
ES2G versus IST				
Positive predictive value	78%	40%	43%	89%
Negative predictive value	86%	89%	82%	100%
Observed agreement (OA)	83%	83%	76%	90%
Chance agreement (CA)	52%	77%	68%	78%
Kappa = (OA – CA)/(1 – CA)	0.65	0.27	0.23	0.55
Agreement interpretation	Substantial	Fair	Fair	Moderate
Kappa				
0	Strength			
0.01–0.20	Poor			
0.21–0.40	Slight			
0.41–0.60	Fair			
0.61–0.80	Moderate			
0.81–1.00	Substantial			
	Almost perfect			

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