Inhibiting CCDs in Serologic Allergy Testing

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In the literature

Lee KW, McKinney BH, Blankenship KD, Morris DO. Detection and inhibition of IgE for cross-reactive carbohydrate determinants evident in an enzyme-linked immunosorbent assay for detection of allergen-specific IgE in the sera of dogs and cats. *Vet Dermatol*. 2020;31(6):439-e116.

FROM THE PAGE ...

Most allergens are proteins or glycoproteins. The carbohydrate portions of glycoprotein (known as cross-reactive carbohydrate determinants [CCDs]) are generally thought to be clinically irrelevant in causing clinical signs; however, CCDs have been known to cause false-positive reactions in allergen-specific immunoglobulin E (IgE) testing in humans and dogs.[1-3]

This study* evaluated 100 canine serum samples and compared the ability of 2 different CCD inhibitors (RIDA-CCD and BROM-CCD) to reduce nonspecific CCD reactivity in serum samples evaluated for allergen-specific IgE. In addition, dog (n = 600) and cat (n = 600) serum samples were evaluated with and without BROM-CCD to investigate the prevalence of CCD in sera of dogs and cats suspected of having clinical allergy.

BROM-CCD was found to be as or more effective at inhibiting CCD as compared with the commercially available inhibitor, RIDA-CCD. CCDs were present in a significant number of canine and feline samples, and <1% and 13% of serologically positive canine and feline samples, respectively, were completely negative of all allergens after a CCD inhibitor was used. Samples positive to mite mixtures appeared to be true positives, as minimal changes were noted after treatment with a CCD inhibitor. Serum samples positive to grass, tree, and weed mixtures appeared to have a higher rate of false positives, as was seen after the samples were treated with a CCD inhibitor.

*Funding for this study was provided by Stallergenes Greer.

... TO YOUR PATIENTS

Key pearls to put into practice:

1. False positives are a common occurrence in serologic allergy testing because of CCDs.
2. A concern with serologic allergy testing is the variability among diagnostic laboratories (eg, only some laboratories use CCD inhibitors), as this can make comparisons difficult. Also, some CCD inhibitors appear to be more effective than others.
3. If serologic allergy testing indicates that a dog or cat is allergic to most or all tested allergens, the next logical step is to perform intradermal allergy testing, which can help eliminate false positives or confirm a panallergenic patient.

References

1. Kaulfürst-Soboll H, Mertens M, Brehler R, von Schaewen A. Reduction of cross-reactive carbohydrate determinants in plant foodstuff: elucidation of clinical relevance and implications for allergy diagnosis. *PLoS One*. 2011;6(3):e17800.
2. Levy BJ, DeBoer DJ. A preliminary study of serum IgE against cross-reactive carbohydrate determinants (CCD) in client-owned atopic dogs. *Vet Dermatol*. 2018;29(3):243-e90.
3. Gedon NKY, Boehm TMSA, Klinger CJ, Udraite L, Mueller RS. Agreement of serum allergen test results with unblocked and blocked IgE against cross-reactive carbohydrate determinants (CCD) and intradermal test results in atopic dogs. *Vet Dermatol*. 2019;30(3):195-e61.