Proceeding of the NAVC
North American Veterinary Conference
Jan. 8-12, 2005, Orlando, Florida

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WHAT’S NEW AND HOT IN ATOPIC DERMATITIS

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PATHOGENESIS

Based on accumulated research findings over the last 30 years, the pathogenesis of canine atopic dermatitis is now known to be much more complex than the simple type 1 hypersensitivity response initially proposed. Atopic dogs are likely to be genetically predisposed to have defective epidermal barrier function (probably associated with abnormal lipid profiles) and polarisation of the lymphocyte population towards the TH2 cytokine subset. A deficiency of the immunosuppressive cytokine TGF-β in the skin may also lead to lack of tolerance towards environmental allergens (especially the high molecular weight *D. farinae* allergen Der f 15) which would penetrate the epidermis and be intercepted by Langerhans’ cells. The Langerhans’ cells would process the antigen and present it to TH2 type lymphocytes in the draining lymph node. Overproduction of IL-4 by the lymphocytes would lead to class-switching by B cells and production of allergen-specific IgE which would bind to cutaneous mast cells. Degranulation of mast cells following exposure to allergen, as well as homing of lymphocytes to the skin, would lead to cutaneous inflammation. The cutaneous inflammation would lead to pruritus and self trauma, which in conjunction with the development of secondary infections, could lead to development of TH1 cytokine-driven inflammation in the chronic phase.

DIAGNOSIS

In recent years, the emphasis placed on the use of specific diagnostic tests for the diagnosis of canine atopic dermatitis has shifted. Initially, the intradermal test was regarded as a diagnostic procedure that could identify atopic dogs. However, it is clear that positive reactions can be obtained in non-allergic individuals, indicating lack of specificity. Also, some dogs with all the classic features of atopic dermatitis yield negative reactions on intradermal allergy testing. These factors indicate that the test should not be used as a sole means of diagnosis. Similar problems occur with in-vitro assay of allergen-specific IgE, even with the advent of highly FcεR1 technology. Other methods of demonstrating the allergic reaction such as basophil release tests, Western blotting or cytokine assays are still purely in the research domain and there is no evidence as yet that they could offer a specific diagnostic test. Hence, most dermatologists currently make a clinical diagnosis of atopic dermatitis based on a consistent history and clinical presentation, and ruling out of all other dermatoses that could look similar. The future may lie in the development of “allergy profiles” in which multiple parameters involved in the development of allergic inflammation are measured simultaneously using traditional and molecular techniques. These could include allergen-specific IgE and IgG, cytokine and chemokine concentrations and other important effector molecules involved in the skin immune system.

TREATMENT

Traditional treatments for atopic dermatitis have included allergen-specific immunotherapy, allergen avoidance, glucocorticoids, antihistamines, essential fatty acid supplementation, control of secondary infections and topical therapy. More recently, studies have demonstrated some efficacy of other drugs such as misoprostol, arofylxime and pentoxifylline. These drugs have not gained widespread use either because of the lack of availability, incidence of adverse effects, or inadequate efficacy. The use of cyclosporine in the management of canine atopic dermatitis has been the most important breakthrough in the last 30 years. This drug can provide excellent control of the clinical signs in atopic dogs with minimal adverse effects, at least in the short to medium term. In many cases, the control is so good that other forms of treatment can be withdrawn. However, the expense of the product may preclude its use from all cases. Topical therapy can be useful for focal lesions and the use of tacrolimus (a cyclosporine type drug) has recently been shown to be beneficial in some cases of atopic dermatitis. The most recent product to be launched onto the atopic dermatitis market is a Chinese herbal product that has been shown to be beneficial in the management of many cases. However, its efficacy does not rival that of glucocorticoids or cyclosporine. The use of allergen-specific immunotherapy has remained virtually unchanged for decades but a recent innovation may improve its efficacy, especially in refractory cases. Mixing the allergen vaccine with liposome-nucleic acid complexes was shown to down-regulate the TH2 cytokine response and enhance the treatment’s efficacy. However, further studies are required to substantiate these early findings. Treatment strategies such as anti-IgE therapy and anti-cytokine therapy are currently in the research domain and are unlikely to become practical realities for many years, if at all.