

Vitamin E Supplementation in Cats' Diets

This study investigated the effects of vitamin E (Vit E) and selenium (Se) dietary supplementation on feline immunological parameters. Vit E and Se are known to have immune-enhancing effects when supplemented in human and animal diets. Though the mechanism is not completely understood, Vit E is thought to enhance innate and acquired immunity through its antioxidant activity, reduction of immunosuppressive compounds (eg, prostaglandin E₂ and nuclear factor κ B), and enhancement of interleukin-2 production. Little is known about the effects of Vit E and Se supplementation on feline immune function.

Cats ($n = 72$) of varying ages were assigned to receive 1 of 9 diets supplemented with varying Vit E and Se levels or a control diet. Blood samples were drawn on days 0, 14, and 28, and leukocytes were analyzed for lymphocyte proliferation, immunophenotype, and phagocytic activity. After 28 days, enhanced lymphocyte proliferative responses were observed in cats fed diets containing Vit E. A higher dose of Vit E did not have a greater effect than a moderate dose. Vit E had a strong positive effect on peripheral blood leukocyte phagocytic activity. Se supplementation did not affect immune function. Immunophenotype was not altered by Vit E or Se supplementation. The authors conclude that Vit E supplementation at moderate levels

is adequate to induce beneficial effects on feline immune function.

Commentary

Vit E is recommended as adjunct treatment of a variety of chronic inflammatory or immune-mediated diseases—particularly of the skin and gastrointestinal tract—in dogs and cats. Most of these recommendations are extrapolated from other species so, for feline patients, this article is particularly valuable. Although it is tantalizing to promote Vit E supplementation based on the significant finding of enhanced lymphocyte function, specific benefits are not clear. The long-term effects and specific dosing recommendations in healthy cats are needed before it can be evaluated for disease therapy. Future studies should clarify Vit E's immunologic impact and guide study of supplementation for specific disease conditions.—*Elizabeth Layne, DVM, Resident in Dermatology (University of Wisconsin)*

Source

O'Brien T, Thomas DG, Morel PC, Rutherford-Markwick KJ. Moderate dietary supplementation with vitamin E enhances lymphocyte functionality in the adult cat. *Res Vet Sci*. 2015;99:63-69. <http://www.sciencedirect.com/science/article/pii/S0034528815000326>. Published April 2015. Accessed May 20, 2015.

RESEARCH NOTE

FOCUS Case Study: Pemphigus Foliaceus in a Shih Tzu

Pemphigus foliaceus, an autoimmune skin disease in dogs, is usually treated with high-dose corticosteroids and other immunosuppressant drugs with common adverse effects. Stem cell therapy may be a promising alternative. Mesenchymal stem cells mediate the adaptive and innate immune responses through inhibition of a variety of cell types.

In this case study, adipose tissue-derived mesenchymal stem cells (ATMSCs) were employed in the successful treatment of steroid-refractory pemphigus foliaceus in a dog. A 10-year-old shih tzu with pemphigus foliaceus was referred to a veterinary teaching hospital with severe pruritus, anorexia, weight loss, and classic generalized lesions. Full workup, including impression smear cytology, skin scrapings, CBC, serum chemistry panel, and skin biopsies were consistent with pemphigus foliaceus. The patient was treated with oral prednisolone (4 mg/kg/day) and cephalexin (60 mg/kg/day). Signs improved but reoccurred

after 1 month. Cyclosporine (5 mg/kg/day) and azathioprine (2 mg/kg/day) were added, but clinical signs did not improve. Stem cell therapy was initiated with canine ATMSCs experimentally transfected with canine cytotoxic T-lymphocyte antigen 4 (CTLA4). CTLA4-expressing ATMSCs were injected intravenously (1×10^6 cells/kg) at 2-8 week intervals for 21 treatments over 20 months. Pruritus and skin lesions improved after 1 treatment. Over several treatments, oral prednisolone was gradually reduced to 0.25 mg/kg/day and azathioprine was discontinued. The dog remained in remission for 1 year with minimal pruritus and crusting even after the gradual cessation of stem cell therapy. The authors conclude that CTLA4-ATMSCs could be beneficial in treating pemphigus foliaceus in dogs.

Source

Han SM, Kim H-T, Kim KW, et al. CTLA4 overexpressing adipose tissue-derived mesenchymal stem cell therapy in a dog with steroid-refractory pemphigus foliaceus. *BMC Vet Res*. 2015;11(1):49.