Investigations on the effects of sublingual immunotherapy on clinical signs and immunological parameters using a canine model of atopic dermatitis: a double blinded, randomized, controlled study.

Rosanna Marsella DVM Dipl ACVD, Kim Ahrens, BS, MB ASCP

University of Florida, College of Veterinary Medicine, Department of Small Animal Clinical Sciences, Gainesville, Florida

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Introduction

Sublingual immunotherapy (SLIT) has been used in human medicine with good success for allergic rhinitis and asthma (1). More recently beneficial effects have also been reported for atopic dermatitis (2,3). An advantage of SLIT is the easy administration and tolerability. Limited studies exist in veterinary medicine. The purpose of the present study was to evaluate safety and efficacy of SLIT in an experimental model for canine AD.

Materials and methods

Experimental design: Double blinded, prospective, randomized, controlled.

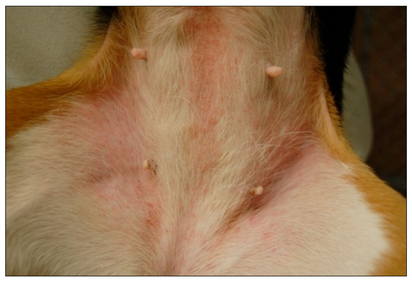
Animals: Eighteen atopic Beagles, sensitized to dust mites (DM, *Dermatophagoides farinae*), timothy grass (TG) and ragweed (RW).

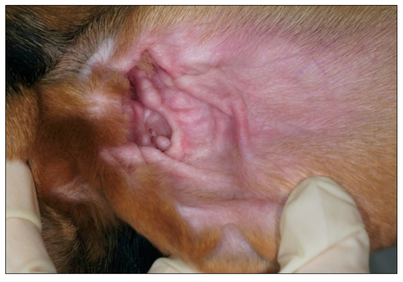
Group allocation: Dogs were randomly divided into control (n=6, vehicle or 50% glycerine) and active group (n=12, allergen mixture of DM 5,000 aq, TG 1-20 w/v and RW 1-20 w/v, in 50% glycerine, Nelco laboratories). The following schedule was used: 3 squirts (0.3ml) sublingually daily in the first month, 6 squirts daily for the second month and 8 squirts daily from the third month until the end of study (total of 12 months).

Blood samples: Blood (12ml) was drawn at baseline, 4, 8, and 12 months of SLIT and 2 months after stopping SLIT.

Immunologic parameters: 4 mls were used to measure allergen-specific IgE Allercept (Heska). 8mls were used for PBMC isolation, stimulation and measurement of IL-10 and TGF-beta1 using Elisa Assays (R&D Systems, Minneapolis, MN).

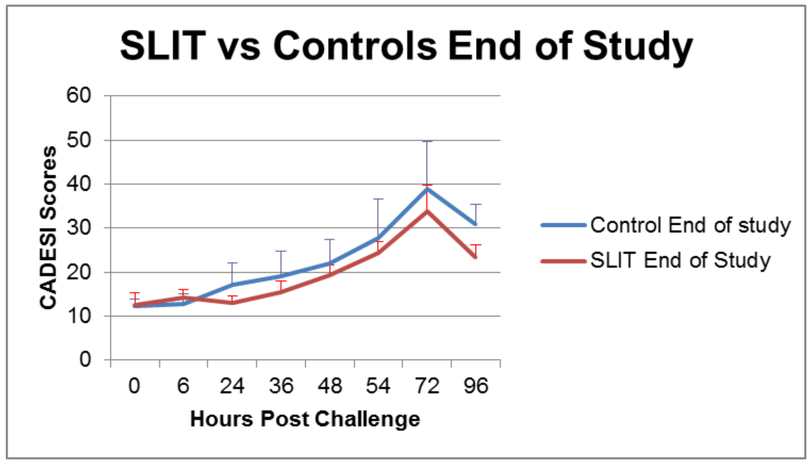
Allergen challenge and assessment of clinical signs: 50mg of crude allergens (mix of DM, RW, TG) were applied epicutaneously for 3 consecutive days. Clinical signs were scored using CADESI at baseline and at the end of SLIT.





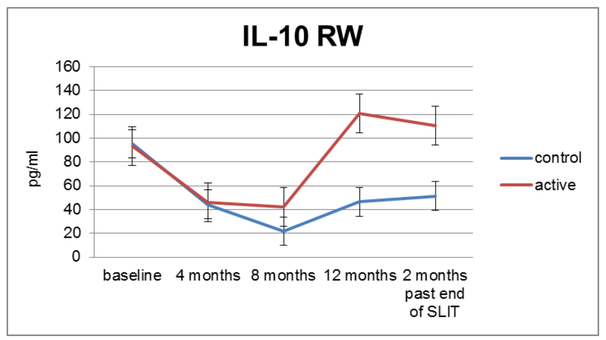
Abstract

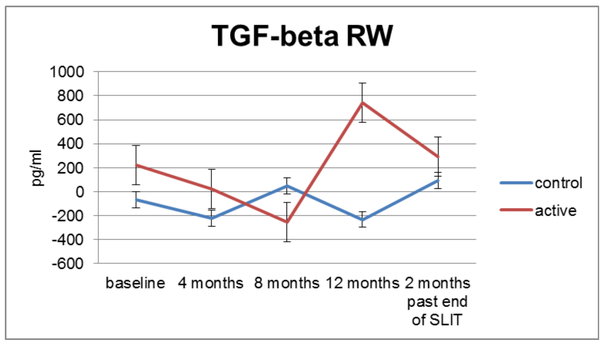
This prospective, randomized, controlled study aimed to evaluate clinical and immunological effects of one year of SLIT. Eighteen atopic Beagles, sensitized to dust mites (DM), timothy grass (TG) and ragweed (RW) were randomly divided into control (n=6, vehicle) and active (n=12, 3 allergens) groups. Allergen challenge and scoring of clinical signs during challenge was done before and at the end of SLIT. Clinical signs (without challenge) were scored after 1, 2, 3, 4, 8 months and 2 months after stopping SLIT. Blood was drawn at baseline, 4, 8, and 12 months of SLIT and 2 months after stopping for allergen-specific IgE, IL-10, and TGF-beta. For clinical scores, ANOVA showed significant effect of time (end < beginning). One dog in each group worsened at the end of study. Improvements were as follows: in the controls 0 >80%, 1/6 61-80%, 2/6 41-60%; 2/6 21-40%, 0<20%; in the active group 0>80%, 1/12 61-80%, 7/12 41-60%, 2/12 21-40%, 0<20%. Overall the % of dogs that improved >40% was 50% in the control and 66% in the active group. For allergen-specific IgE a significant effect of time was found for DM (end < beginning), RG (end > beginning). For TGF-beta, significant effects of group (active > control) and time (end > beginning) were found for RW. For IL-10 a significantly effect of group (active > control) and time (end > beginning) was found for RW. Also for IL-10, a significant effect of time (end > beginning) and group x time interaction were found for TG.



Results & Discussion

ANOVA showed a significant decrease of CADESI scores at the end of the study . Only DM-specific IgE significantly decreased at the end of the study. For TGF-beta, a significant effect of group (active>control) and time (end>beginning) were found for RW. For IL-10 , a significant effect of group (active>control) and time (end>beginning) were found also for RW. In summary, SLIT was safe, easy to administer and well tolerated by the majority of dogs. Some of the dogs in this trial that majorly improved with SLIT were dogs that had several years history of severe allergies thus this form of immunotherapy seems very promising and very safe.





References

1. Emanuel IA, Parker MJ, Traub O. Undertreatment of allergy: exploring the utility of sublingual immunotherapy. [Otolaryngol Head Neck Surg. 2009 May;140(5): 615-21.
2. Pajno GB, Finegold I. SIT beyond respiratory diseases. Ann Allergy Asthma Immunol. 2011 Nov;107(5):395-400.
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