EFFICACY OF A FATTY ACID SUPPLEMENT TO REDUCE CLINICAL SIGNS OF ATOPIC DERMATITIS IN DOGS AND CHANGE SERUM FATTY ACID LEVELS: A DOUBLE-BLINDED PLACEBO-CONTROLLED CROSS-OVER STUDY

K. CAMPBELL1, A. MARDINI1, C.A. RÉME2, P. JASMIN2, O. ELFASSY2, S. RADECKI3, F. GOODMAN3
1University of Illinois, College of Veterinary Medicine, Department of Medicine, Urbana, Illinois; 2Virbac SA, Medical Department, Carros, France; 3Statistical consultant, Fort Collins, Colorado; 4Virbac Research and Development, Fort-Worth, Texas

BACKGROUND

Megaderm® (US: Omegaderm®) oral emulsion is a dietary supplement designed to help control skin allergies in dogs. The product contains 450 mg/ml of omega-6 and omega-3 fatty acids (EFA) in a ratio of 5:1, together with vitamin A and E co-factors. It aims at restoring skin integrity and regulating the metabolic pathways responsible for the inflammatory response observed in atopy.

Other brand names: Complederm

MATERIALS & METHODS

Study format: randomized, double-blinded, placebo-controlled, cross-over, clinical response trial.

Animals: 23 dogs, of various breed and age, diagnosed with canine atopic dermatitis (CAD) according to revised Willemse criteria, after exclusion of other skin diseases and treatment of previous infections.

Treatments:

- **Allocation Sequence**: 8 weeks
  - 10 dogs
    - 1 Megaderm® SID
    - 8 Placebo SID
  - 13 dogs
    - 2 Placebo SID
    - 11 Megaderm® SID
- **Dose for both products**: 5-20 ml / weight (label test product dose).
- **Megaderm® calculated mean daily EFA intake > eicosapentaenoic acid (EPA 28 mg/kg), Docosahexaenoic acid (DHA 19 mg/kg), linoleic acid (LA 229 mg/kg), gammalinolenic acid (GLA 5 mg/kg).
- **Placebo**: generic olive oil (75% oleic acid, 7% linoleic acid).
- **Concurrent medications**: 1/3 of dogs exhibited other corticosteroid, antihistamine, other EFAs supplement or EFA-enriched diet, thyroid supplementation or anti-pruritic shampoo.
- **Clinical evaluation**: lesions: erythema, excoriation, lichenification, pruritus.
- **Determination of serum FA levels**: 10 ml of whole blood collected following overnight fast.
- **Gas liquid chromatography.**
- **Results as mg individual EFA/100mg total C14-22 fatty acids (% weight).**

RESULTS

- **Most frequent major CAD features**: pruritus (100% of dogs), facial and/or digital involvement (96%), chronic/relapsing dermatitis (91%).
- **Most frequent minor CAD features**: onset of signs <3 years of age (96%), recurrent superficial pyoderma or otitis externa (65%), facial erythema/cheilitis (52%).
- **No treatment carryover effects were detected in this study (RM ANOVA, P>0.05, SAS), thus results of both periods could be evaluated.**
- **Megaderm® significantly reduced the PICAD (40%) as compared to the placebo (14.7%) over the 8-week period (RM ANOVA, P<0.05, SAS), Fig 1.**
- **The LICAD was significantly reduced at week-8 in both Megaderm® (55.2%) and placebo group (28.8%).** Fig 2.
- **The serum concentrations of anti-inflammatory omega-3 fatty acids, EPA and DHA, were significantly increased in the EFA treated dogs as compared to the placebo as from week-4 of supplementation onward.** Fig 3.
- **By week 8, the serum concentration of LA, a major component of the epidermal intercellular lipid cement, was increased in the EFA group versus the placebo.**
- **Megaderm® supplementation decreased the percent of pro-inflammatory omega-6 fatty acids, dithromagamalinolic acid (DGLA) and adrenic acid (precursors of arachidonic acid, AA), in the blood of treated dogs as compared to placebo controls.** Fig 4.

CONCLUSIONS AND CLINICAL RELEVANCE

- **Megaderm® supplementation at label dose** proved more effective than placebo to decrease pruritus in dogs with atopic dermatitis.
- **Despite dogs in this study were fed differing basal diets, the supplement was successful in altering the composition of their serum fatty acids, increasing the concentrations of EFAs that play key roles in epidermal barrier restructuring and inflammation attenuation.** Fig 5
- **Beneficial effects of a supplement containing preserved EFAs can therefore be obtained without the need to change the basal diet itself. Significant reduction of the lesions in the placebo group may be attributed to so-called placebo effect, slight beneficial effect of olive oil, intermittent bathing with the chlorhexidine shampoo or the few concurrent medications given to individuals.** This underscores the need for controlled studies in assessing the impact of therapeutic measures. A trend for clinically significant better score reduction was nevertheless apparent with Megaderm® by week 8. A longer period of EPA supplementation, or a higher number of test animals, may be required to detect statistically significant differences.

Fig 1. Pruritus index over the study period

Fig 2. Lesional index over the study period

Fig 3. EPA serum levels

Fig 4. DGLA serum levels

Fig 5. Structural and functional roles of EFAs