Allergological evaluation of a dog population in a veterinary immuno-allergology consultation: What correlates in a canine model

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INTRODUCTION

Canine allergic dermatitis (cAD) can be framed in one of the following conditions: **i) atopic dermatitis**; **ii) food allergy dermatitis**; **iii) flea allergy dermatitis; iv) *Malassezia* dermatitis**, or **v) contact dermatitis** [1]. It is the most frequent condition in veterinary dermatology [2,3] and is associated with either type I or IV hypersensitivity [4]. Flea allergy dermatitis represents a relevant number of cases and results from the response against flea saliva antigens inoculated by the bite, triggering an inflammatory process mostly located at the lumbar and rump regions [5](Fig. 1). A more or less localized inflammatory skin condition will characterize atopic, contact [5,6] or food-induced [7,8,9] dermatitis (Fig. 2 to 4).

With **pruritus** and its consequences as main complaints, **diagnosis** is based on **clinical history**, observed **signs** and **exclusion of other causes of dermatitis**, such as parasitic or bacterial infections and food intolerance [10]. The identification of IgE-mediated cutaneous reactivity by **intradermal tests (IDT)** (Fig. 5) and serological determination of **allergen-specific IgE** are of considerable complementary diagnostic value [3,11,12,13]. Elimination or hypoallergenic diets are the diagnosis means for food allergy [9].

AIM

1. Characterization of clinical signs associated with cAD in the study population; **2**. Identification of possible correlations between environmental factors, clinical signs, IDT and specific IgE.

METHODS

1. Patient selection and characterization: Veterinary Hospital of the University of Évora (Portugal) + Rof Codina University Hospital (Lugo, Spain) outpatient consultations → **clinical inquiry** → **55 dogs with AD** (30 F; 25 M) → **IDT + specific IgE**. **Predisposed breeds** = 35; **Indoor** = 41.

2. Procedures: Detailed **anamnesis** and **clinical examination**. Dermatology and otology, parasitological and microbiological tests were performed when necessary for further information. **IDT** were performed using commercial extracts for fungi, grass, herbs and tree pollens, mites, food and flea. **Specific IgE** were determined according to Lee *et al.* (2009)[14] in a commercial laboratory.

3. Statistical analysis: Data normality was tested with Kolmogorov-Smirnov and homogeneity of variances checked with Levene´s test. Descriptive statistics was performed by the percentage of occurrence for all variables. To access the relationship between environmental factors, clinical signs, IDT and specific IgE the parametric Pearson's R test was applied. The level of significance has been set at $p < 0.05$. Statistical Package for Social Sciences (SPSS) version 17.0 was used.

RESULTS and DISCUSSION

1. **Age at first signs** <3 years old in 82% of patients, in accordance to Favrot *et al*. (2010)[15], and <1 year old in 24%.
2. **Signs:** Itching in 70% of patients (generalized in 66%, with 78% of paw licking and chewing).
3. **Seasonal worsening** in 64% of patients.
4. **Dermatitis** was already present in 69.1% of patients, 50% presented **external otitis** (Fig. 4 and 6) and 28.9% **self-induced alopecia**. "Intense itching" was found in 10.5%, "medium itching" in 81.6% and "mild itching" in 5.26% of the patients, according to Rybníček *et al*. (2009)[16].
5. **Positive IDT:** 37.3 % to ***L. destructor***, 29.41% to ***D. farinae***, 27.5% to ***D. pteronyssinus***, 25.5% to ***D. glomerata*** and 21. 6% to **Malassezia spp**. From the 37 dogs submitted to food IDT, 40.5% revealed positive to **beef**, 27% to **chicken** or **porc** and 5.4% to **lamb**.
6. **Specific IgE** >150 ELISA Absorbance Units (EAU) was found in 84% of dogs to **indoor allergen sources** and in 68% to **pollens**.
7. **Positive correlation** was found between pollen sensitization, seasonality of signs ($R=0.518$; $p=0.001$) and positivity for *D. glomerata* ($R=0.352$; $p=0.007$). Chronic otitis correlated positively with alopecia (fairly: $R=0.043$; $p=0.008$) and reactivity to *L. destructor* ($R=0.446$; $p=0.008$), *P. lanceolata* ($R=0.435$; $p=0.026$) and *P. acerifolia* ($R=0.402$; $p=0.017$).
8. **Negative correlation** was found between outdoor life and the intensity ($R=-0.333$; $p=0.033$) and precocity ($R=-0.356$; $p=0.026$) of signs.
9. **No correlation** was found between ITD and specific IgE, as these methods evaluate different parameters – specific IgE refers to circulating IgE concentrations, while IDT detect mast cell-bound specific IgE [17,18].

CONCLUSIONS

1. **Correlation** between different clinical signs and positive testing for some allergenic sources may occur, as well as between sensitization to pollens and the beginning, the severity and the seasonality of clinical signs.
2. **Outdoor life** may be a protective factor to the severity of signs.

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