

The clinical effect of environmental control of house dust mites in 60 house dust mite-sensitive dogs

CHRISTINE SWINNEN* and MARGREET VROOM†

*Dierenkliniek Venhei, Geelse Baan 96, 2460 Kasterlee, Belgium, †Veterinaire Specialisten Oisterwijk, Boxtelsebaan 6, 5061 VD Oisterwijk, the Netherlands

(Received 4 February 2003; Accepted 29 July 2003)

Abstract The purpose of this study was to evaluate the effects of benzyl benzoate, an acaricide for the control of house dust mites, in 60 house dust mite-sensitive dogs. All dogs showed positive reactions on intradermal skin testing for house dust mites (*Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*) alone, or house dust mites with storage mites (*Acarus siro*, *Tyrophagus putrescentiae*, *Glycophagus domesticus*). House dust samples from the owners' houses were collected and sent to the clinic, where the authors performed a test (Acarex® test) to semiquantify the amount of guanine, a house dust mite product. Treatment with benzyl benzoate was repeated until the house dust samples were negative for house dust mite guanine. After treatment, 29 out of 60 house dust mite-sensitive dogs (48%) showed no skin lesions or pruritus. Moderate results were achieved in 22 dogs (36%), with reduced pruritus and minimal skin lesions, but still requiring medication. In 13 dogs, this involved regular treatment (3–4 times a year) with antibiotics and antiyeast medication, and in eight dogs, immunotherapy was used. One dog was controlled with essential fatty acids as monotherapy and one dog was controlled with immunotherapy and essential fatty acids. In the remaining nine dogs (15%), the pruritus remained the same, and these dogs were controlled with oral corticosteroids. These results indicate that house dust mite elimination is a useful tool in the management of house dust mite-sensitive dogs.

Keywords: acaricide, atopy, benzyl benzoate, house dust mite-sensitive dogs.

INTRODUCTION

House dust mites (HDM) and storage mites are the major cause of atopic disease in the dog and humans.^{1–4} In humans, avoidance of exposure to HDM has been achieved using aggressive house dust mite avoidance measures including: (1) encasing mattresses, box springs and pillows with hypoallergenic covers; (2) removing carpets; (3) replacing upholstered furniture; (4) washing bed linen in hot water; (5) controlling indoor temperature and humidity; and (6) using an acaricide. Studies in humans have shown that the acaricide benzyl benzoate reduced the house dust mite levels in houses and lead to significant improvement in symptoms of house dust-mite-allergic patients.^{5–10} In veterinary medicine, atopic dermatitis is currently managed by allergen avoidance and/or drug therapy, and/or allergen-specific immunotherapy. Allergen avoidance would appear to be a simple, effective and inexpensive treatment, although, to our knowledge, environmental control of HDM has never been reported in veterinary medicine. The aim of this study was to investigate the efficacy of household treatment with benzyl benzoate in reducing the clinical signs of canine atopic dermatitis.

MATERIALS AND METHODS

Animal selection

One hundred atopic HDM-sensitive dogs were initially included in this study. The following clinical work-up was performed for each dog. Several skin scrapings were taken to exclude ectoparasitic infestation, and in some cases a therapeutic acaricidal trial with selamectin (Stronghold, Pfizer Animal Health, Sandwich, UK) was undertaken. All patients underwent two food trials of 6 weeks each to exclude adverse reactions to food. The diagnosis of atopic dermatitis was based on the clinical criteria described by Willemse,¹¹ a combination of epidemiological and clinical data, and immunological criteria (demonstration of type 1 hypersensitivity due to the presence of at least one positive skin test reaction within 20 min of an intradermal test). The intradermal skin tests were performed using ARTU® allergens (Artuvetrin, Intervet, Boxtel, the Netherlands). Only dogs with positive skin reactions to *Dermatophagoides farinae* or *pteronyssinus*, with or without storage mites, were included in the study. Dogs with positive reactions to pollens, flea allergen or animal dander were excluded. Dogs with cytological evidence of bacterial and/or *Malassezia* infection during the HDM control were treated with cephalosporin (30–40 mg kg⁻¹ once daily) and/or ketoconazole (10 mg kg⁻¹ daily) in combination with a 2% miconazole/chlorhexidine-containing shampoo (Malaseb shampoo, Dermacare, Sydney, Australia).

Correspondence: Christine Swinnen, Dierenkliniek Venhei, Geelse Baan 96, 2460 Kasterlee, Belgium. E-mail: christine.swinnen@skynet.be

Table 1. Criteria for the evaluation of pruritus by the investigators

Grade	Definition
Excellent	No pruritus or evidence of self trauma
Moderate	Moderate pruritus (evident excoriations in more than one part of the body)
Poor	Severe pruritus (scratching, chewing or licking with skin infections)

No flea control was performed. The severity of pruritus was graded according to the criteria shown in Table 1.

House dust sampling and detection of house dust mite guanine

House dust was collected by the owners in their homes using a vacuum cleaner. The owner was instructed to use the small mouthpiece of the vacuum cleaner for efficient sampling. A house dust collector (a small plastic tube) was placed in the tube of the vacuum cleaner to allow carpets and mattresses from different rooms to be sampled separately. The collector was cleaned after each sampling and the different house dust samples were mailed to the investigators for analysis.

The Acarex-test® (Allergopharma, Reinbeck, Bonds Republic Duitsland [BRD], the Netherlands) is a colourimetric test designed to detect guanine, a metabolite of the purine metabolism of Arachnidae. Guanine is a major component of the excrement of house dust mites and can be found in house dust. Bird excrements can also contain guanine but it has been shown that the amount of bird guanine in house dust samples is far less important than that produced by house dust mites.¹² The test was performed by the authors on each sample according to the manufacturer's instructions. The house dust samples were mixed with the organic solvent and the test strip was placed in the mixture for 60 s. Any guanine present reacts with an aromatic diazonium compound leading to a colour change. There are three grades of colour changes: red is strongly positive, yellow is moderately positive, and white is negative.

Use of benzyl benzoate (Acarosan®) spray

Benzyl benzoate is an acaricidal agent. Acarosan® spray is a combination of benzyl benzoate and a detergent that penetrates textiles and kills house dust mites. Carpets need to be vacuum cleaned before they are sprayed and after using the spray, no vacuum cleaning is allowed for 1 day. The owners were advised to remove house dust mite-positive rugs and mats, if possible. Mattresses or wall-to-wall carpeting were sprayed with Acarosan® spray and, after 1 month, the investigators checked by telephone to see if all instructions had been performed by the owner. New house dust samples were then collected, and again checked for house dust mite guanine. This procedure was repeated until the Acarex® test was negative.

RESULTS

Out of the 100 atopic HDM-positive dogs originally diagnosed, only 60 came from households with a positive

Acarex® test. The details of these 60 dogs are summarized in Table 2. Thirty male and 30 female dogs of various breeds were included, ranging in age from 1 to 11 years, with a mean age at time of presentation of 6 years. Only these 60 dogs were subjected to further analysis. The dogs could be divided into two groups: (1) 12 animals (20%) that were sensitive to HDM only, and (2) 48 animals (80%) that were sensitive to HDM and storage mites. In the HDM group, 50% were sensitive to *Dermatophagoides farinae* alone and 50% to *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus* (Table 2).

On average, three household treatments were necessary before the Acarex® test became negative. The owners then treated the house every 3 months. We found that in the first group (dogs only sensitive to HDM) five dogs (41%) responded excellently to environmental control of dust mites with the Acarosan® spray. These dogs showed no pruritus, and no medication was needed (Table 1). Three dogs (25%) showed a partial improvement but needed regular (3–4 times a year) courses of antibiotics and antiyeast medication in combination with a 2% miconazole/chlorhexidine-containing shampoo. In four dogs, the pruritus remained the same and they received corticosteroids at the request of the owner.

In group 2 (dogs sensitive to HDM and storage mites), there were 24 dogs (50%) that needed no medication and showed no pruritus (Table 2). In the moderate result group (19 dogs, 37%), other therapies were instituted including immunotherapy (eight dogs) and oral essential fatty acids (one dog). In five dogs (10%) the pruritus remained the same and they received corticosteroids at the request of the owner. These results indicate that household treatment with Acarosan® spray gave good results in approximately 50% of dogs from HDM-positive households without the need for other treatments.

DISCUSSION

Out of the 100 homes containing a HDM-positive dog that were sampled in this study, 40 had a negative result with the Acarex® test. Potential reasons for this include (1) poor collection of the sample by the owner; (2) the samples were not representative; (3) the Acarex® test was not sensitive enough (it is a semiquantitative method that provides information about the amount of living house dust mites and their localization but it is not possible to obtain a quantitative value for each sample); or (4) the houses did not contain HDM. Out of the 60 dogs that came from HDM-positive households, there were 12 dogs that were only sensitive to HDM (group 1) and 48 dogs that were allergic to HDM and storage mites (group 2). We obtained excellent results in five dogs from group 1 and 24 dogs from group 2. In other words, 48% of the dogs were nonpruritic after more than 4 months of household treatment, a result that is comparable or superior to that obtained with allergen

Table 2. Summary of signalment, intradermal test results and clinical response in 60 house dust mite-sensitive dogs from homes with a positive house dust mite test

No.	Breed	Age	Sex	DF	DP	AS	T	G	PB	PA
1	WHW terrier	8 years	F	+					P	P (pred.)
2	WHW terrier	6 years	F	+					P	M (Ab + yeast)
3	WHW terrier	8 years	M	+	+				P	M (Ab + yeast)
4	Jack Russell terrier	4 years	M	+					P	P (pred.)
5	Griffon Bruxelles	3 years 1 month	F	+					P	E
6	Giant schnauzer	3 years	M	+					P	E
7	German shepherd dog	3 years 5 months	F	+	+				P	P (pred.)
8	English cocker spaniel	4 years 1 month	F	+	+				P	E
9	Airedale terrier	2 years	F	+					P	P (pred.)
10	Basset hound	2 years	F	+	+				P	E
11	Berner serner	3 years 5 months	M	+	+				P	E
12	Cairn terrier	6 years 6 months	F	+	+				P	M (Ab + yeast)
13	American Staffordshire terrier	5 years 5 months	M	+		+			P	M (Ab + yeast)
14	Berner serner	5 years 5 months	F	+		+	+		P	E
15	Boxer	3 years 8 months	F	+		+	+		P	E
16	Boxer	2 years	M	+		+	+		P	M (desen. + Ab)
17	Boxer	1 year	M	+		+		+	P	P (pred.)
18	Border collie	4 years 6 months	F	+		+	+		P	E
19	Cross breed	1 year 6 months	F	+	+	+	+		P	E
20	Cross breed	3 years 9 months	M	+		+	+	+	P	E
21	Cross breed	6 years 2 months	F	+	+	+	+	+	P	E (antihist.)
22	Cross breed	4 years 4 months	M	+		+	+	+	P	M (desen. + EFA)
23	Cross breed	4 years 9 months	F	+		+	+		P	E
24	Cross breed	5 years 11 months	M	+		+	+		P	E
25	Cross breed	5 years 1 month	F	+		+		+	P	M (Ab + yeast)
26	Cavalier King Charles	5 years 6 months	F	+		+	+		P	E (antihist.)
27	Dachshund	3 years 8 months	M	+		+			P	M (Ab + yeast)
28	Dachshund	4 years	F	+		+	+	+	P	M (Ab + yeast)
29	German short-hair pointer	5 years 10 months	M	+		+	+		P	E
30	German short-hair pointer	2 years 7 months	F	+		+	+		P	P (pred.)
31	English cocker spaniel	4 years 7 months	F	+		+		+	P	E
32	English springer spaniel	6 years 4 months	F	+		+			P	E
33	Fox terrier	5 years 6 months	F	+		+			P	E
34	German shepherd dog	4 years 7 months	F	+		+	+		P	M (ab + yeast)
35	Golden retriever	6 years 9 months	F	+		+	+		P	E
36	Golden retriever	4 years 10 months	F	+	+	+	+	+	P	E
37	Golden retriever	4 years 4 months	F	+		+	+		P	E
38	Golden retriever	1 year 2 months	M	+		+	+		P	E
39	Golden retriever	6 y-10 months	M	+	+	+	+	+	P	E
40	Jack Russell terrier	7 years 5 months	M	+		+	+		P	P (pred.)
41	Jack Russell terrier	4 years 4 months	M	+		+	+	+	P	P (pred.)
42	Jack Russell terrier	5 years 10 months	M	+	+	+	+		P	E
43	Jack Russell terrier	3 years 10 months	F	+		+			P	P (pred.)
44	Labrador retriever	6 years	M	+		+	+	+	P	M (Ab + yeast)
45	Labrador retriever	3 years 10 months	F	+	+	+	+	+	P	E
46	Labrador retriever	4 years 8 months	F	+		+	+		P	M (desen.)
47	Labrador retriever	2 years 5 months	F	+		+	+		P	M (desen.)
48	Labrador retriever	5 years 10 months	M	+		+	+		P	M (Ab + yeast)
49	Labrador retriever	1 year 10 months	M	+		+			P	M (desen. + Ab)
50	Labrador retriever	3 years 6 months	M	+		+			P	E
51	Labrador retriever	5 years 2 months	F	+		+			P	M (desen. + Ab)
52	Labrador retriever	6 years 11 months	M	+		+	+	+	P	M (desen. + Ab)
53	Labrador retriever	3 years 6 months	M	+		+	+		P	M (EFA + Ab + yeast)
54	Labrador retriever	4 years 4 months	M	+		+	+	+	P	E
55	Labrador retriever	6 years 2 months	F	+		+	+	+	P	M (Ab + yeast)
56	Labrador retriever	3 years 8 months	M	+		+	+		P	M (Ab + yeast)
57	Petit Basset Griffon	8 years	M	+		+	+		P	E
58	Polsky Owezarek	3 years 8 months	F	+		+	+		P	M (desen.)
59	Rottweiler	4 years 6 months	M	+		+	+		P	E
60	Shetland sheepdog	4 years 11 months	M	+		+	+	+	P	M (Ab + yeast)

DF, *Dermatophagoides farinae*; DP, *Dermatophagoides pteronyssinus*; AS, *Acarus siro*; T, *Tyrophagus putrescentiae*; G, *Glycophagus domesticus*. +, positive result; PB, pruritus grade before benzyl benzoate; PA, pruritus grade after benzyl benzoate and (prescribed treatment); pred, prednisolone treatment; Ab, antibiotic treatment; desen, allergen-specific immunotherapy; antihist, antihistamine treatment; EFA, essential fatty acid treatment. For definitions of P, M and E, see Table 1.

immunotherapy.¹³ Unfortunately, this study was an open, uncontrolled study, and a possible placebo effect was not considered. Also, the assessment of clinical response was made by telephone conversation, which was likely to be subjective to a certain degree. These factors could have influenced the results and distorted the true efficacy of treatment to some extent.

Three dogs from group 1 and 19 dogs from group 2 still required antibiotics and antiyeast medication, after which there was a notable improvement in the clinical signs. This showed that different factors, such as infections with bacteria and yeast, can contribute to the severity of clinical signs in affected patients. In group 2, eight dogs were also still being treated with allergen-specific immunotherapy. Overall, 36% of the two groups still showed a moderate response.

Only four dogs from group 1 and five dogs from group 2 did not show any improvement following household treatment, representing 15% of the total. In these cases, the results of the intradermal skin test might have been an irrelevant reaction, possibly due to the concentration of the allergens employed.¹⁴ Alternatively, the lack of response could be due to incorrect use of the spray by the owner.

The results for the dogs that were sensitive to HDM alone or HDM/storage mites were similar. This could suggest that HDM were more important than storage mites, as the benzyl benzoate was only applied to textile materials such as beds, carpets, upholstered furniture and soft toys. The storage mites found in low quantities in home textiles occur in higher quantities on fungal-ridden walls and ceiling surfaces.¹⁵ They are more sensitive to desiccation than house dust mites and need a continuously humid environment for fast development (relative humidity of 70–98%).¹⁶ Another possibility is that the intradermal reactions to storage mites in some dogs represented cross-reactivity between allergens in HDM and storage mites.¹⁷

In humans, house dust mite elimination has been practised for many years. According to some studies, good results are seen when the elimination protocol is performed correctly.^{18–23}

In addition to the use of acaricides, steam cleaning, ventilation and dehumidifiers may also be beneficial in the control of house dust mite allergens.^{24–27} However, other papers report that HDM reduction with current chemical (acaricidal) or physical measures (such as vacuum cleaning, heating, barrier methods, or air filtration systems) were ineffective and could not be recommended as prophylactic treatments for patients sensitive to HDM mites.²⁸ Our findings support the findings in the human literature of the benefits of benzyl benzoate. Benzyl benzoate denatures the allergen and is normally applied as a moist powder, foam or spray for 6 h every 6 months. We chose benzyl benzoate for several reasons including the ease of application, cost, lack of damage to treated surfaces and lack of potential side-effects in pets and owners. Fink²⁸ showed that it was safe for pregnant women, children and babies. In our study, we used the spray, not the powder, and modified the manu-

facturer's protocol. Huss *et al.*²⁹ showed that benzyl benzoate powder applications may not be effective when performed according to the manufacturer's instructions. Furthermore, Hayden *et al.*^{30,31} found that benzyl benzoate should be left on carpets for a minimum of 12 h and brushed in twice to be effective. We left the benzyl benzoate on for 24 h on treated surfaces. In all our cases, the procedure needed to be repeated at least 1 month after the first treatment, and in some cases 3 or more months of treatment were required until the Acarex® test became negative. The average number of treatments required to obtain a negative result was three applications. Carpet application techniques may be a significant factor in the effectiveness of the acaricide. We advised the owners of the dogs that responded poorly to repeat the spraying. Although the Acarex® test became negative, there was no improvement at all in 15% of the dogs.

In conclusion, this study has shown that household treatment with benzyl benzoate spray, applied consistently and thoroughly, can significantly reduce the levels of dust mite guanine in the environment. Elimination of HDM from the homes of HDM and/or storage mite-sensitive dogs appears to be a very effective tool in reducing the clinical signs of HDM-allergic dogs. The results of this study suggest that treatment with benzyl benzoate is as effective as allergen-specific immunotherapy, with or without additional treatment with antibiotics and antiyeast medication. Additional studies with larger numbers of patients evaluated in blinded, placebo-controlled trials are necessary to confirm the present clinical impressions and to make strong recommendations for the use of benzyl benzoate to treat the homes of house dust mite-sensitive dogs.

ACKNOWLEDGEMENT

We would like to thank Ooms Allergy for supplying the Acarex® test.

REFERENCES

1. Deblay, F., Casel, S., Mbazona-Amougou, C. Atopie et environnement domestique. *Revue Française D'allergologie* 2000; **40**: 110–18.
2. Prélaud, P., Guaguère, E., Alhaidari, Z. *et al.* Reevaluation of diagnostic criteria of canine atopic dermatitis. *Revue de Médecine Vétérinaire* 1998; **149**: 1057–64.
3. Carlotti, D.N., Costargent, F. Analyse statistique de cutanés positives chez 449 chiens atteints de dermatite allergique. *Pratique Médicale et Chirurgicale de l'Animal de Compagnie* 1992; **27**: 53–68.
4. White, S.D., Bordeau, P. L'Atopie chez le chien: données actualisées. *Point Vétérinaire* 1995; **27**: 91–201.
5. Murray, A.B., Ferguson, A.C. Dust-free bedrooms in the treatment of asthmatic children with house dust mite allergy: a controlled trial. *Pediatrics* 1983; **71**: 418–22.
6. Sarsfield, J.K., Gowland, G., Toy, R. *et al.* Mite-sensitive asthma of childhood: trial of avoidance measures. *Archives of Disease in Childhood* 1974; **49**: 716–21.

7. Walsham, M.J., Evans, C.C. Allergen avoidance in house dust mite sensitive adult asthma. *Quarterly Journal of Medicine* 1986; **58**: 99–215.
8. Ehnert, B., Lau-Schadendorf, S., Weber, A. *et al.* Reducing domestic exposure to dust mite allergen reduces bronchial hyperreactivity in sensitive children with asthma. *Allergologie* 1992; **11**: 135–8.
9. Kersten, W., Stollewerk, D., Musken, H. A clinical study on the effectiveness of Acarosan in treating house-dust mite allergy. *Allergologie* 1988; **11**: 317–90.
10. Brown, H.M., Merrett, T.G. Effectiveness of an Acaricide in management of house dust mite allergy. *Annals of Allergy* 1991; **67**: 25–31.
11. Willemse, T. Atopic dermatitis. A review and reconsideration of diagnostic criteria. *Journal of Small Animal Practice* 1986; **27**: 771–8.
12. Bisschoff, E. *et al.* Farbnachweis für allergenhaltigen Hausstaub, mitteilung. *Allergologie* 1995; **7**: 97–9.
13. Griffin, C.E., Hillier, A. The ACVD task force on canine atopic dermatitis (XXIV): allergen-specific immunotherapy. *Veterinary Immunology and Immunopathology* 2001; **81**: 363–83.
14. Mueller, R.S., Fieseler, K.V., Rosychuk, R.A.W. *et al.* Intradermal testing with the storage mites *Tyrophagus putrescentiae* and *Lepidoglyphus destructor* in normal dogs and dogs with atopic dermatitis. *17th Annual AAVD & ACVD Meeting*. New Orleans, 2002: 22.
15. Kort, H.S.M. A structured approach to allergen avoidance in dwellings with special emphasis on the ecosystem of humid indoor walls and room partitions PhD Thesis. Eindhoven: Eindhoven University of Technology, 1994.
16. van Bronswijk, J.E.M.H. *House Dust Biology for Allergists, Acarologists and Mycologists*. NIB: Zeist, 1981.
17. Griffin, P., Ford, A.W., Alterman, L. *et al.* Allergenic and antigenic relationship between three species of storage mite and the house dust mite, *Dermatophagoides pteronyssinus*. *Journal of Allergy and Clinical Immunology* 1989; **84**.
18. Bisschoff, E., Fischer, A., Liebenberg, B. Assessment and control of house dust mite infestation. *Journal of Clinical Therapy* 1990; **12**: 216–20.
19. Tan, B.B., Weald, D., Strickland, I. *et al.* Double blind controlled trial effect of house dust mite allergen avoidance on atopic dermatitis. *Lancet* 1996; **347**: 15–18.
20. Evans, R. Environmental control and immunotherapy for allergic disease. *Journal of Allergy and Clinical Immunology* 1992; **90**: 462–8.
21. Lau-Schadendorf, S., Rusche, A.F., Weber, A.K. *et al.* Short-term effect of solidified benzyl benzoate on mite-allergen concentrations in house dust. *Journal of Allergy and Clinical Immunology* 1991; **87**: 41–7.
22. Brown, H.J.M., Merret, T.G. Effectiveness of an acaricide in management of house dust mite allergy. *Annals of Allergy* 1991; **67**: 25–31.
23. van Bronswijk, J.E.M.H., Schober, G., Kniest, F.M. The management of house dust mite allergies. *Journal of Clinical Therapy* 1990; **12**: 221–6.
24. Woodfolk, J.A., Hayden, M.L., Couture, N. *et al.* Chemical treatment of carpets to reduce allergen: comparison of the effects of tannic acid and other treatments on proteins derived from dust mites and cats. *Journal of Allergy and Clinical Immunology* 1995; **96**: 325–33.
25. Colloff, M.J., Taylor, C., Merrett, T.G. The use of domestic steam cleaning for the control of house dust mites. *Clinical and Experimental Allergy* 1995; **25**: 1061–6.
26. Sundell, J., Wickman, M., Pershagen, G. *et al.* Ventilation in homes infested by house-dust mites. *European Journal of Allergy and Clinical Immunology* 1995; **50**: 106–12.
27. Pedro C., Gabriel, J.-S. *et al.* Reduction of house dust mite allergens after dehumidifier use. *Journal of Allergy and Clinical Immunology* 1995; **95**: 635–6.
28. Fink, E. Gutachten über die Verträglichkeit von Acarosan Feuchtpulv und Acarosan Schaum bei der Verwendung im Haushalt. *Allergie und klinische Immunologie* 1988: 434.
29. Huss, R.W., Huss, K., Squire, E.N. *et al.* Mite allergen control with acaricide fails. *Journal of Allergy and Clinical Immunology* 1994; **94**: 27–32.
30. Hayden, M.L., Rose, G., Diduch, K.B. *et al.* Benzyl benzoate moist powder: investigation of acaricidal activity in cultures and reduction of dust mite allergen in carpets. *Journal of Allergy and Clinical Immunology* 1992; **89**: 536–45.
31. Platts-Mills, T.A.E. Environmental control of house mites – new products. What they are and how to use them. *Immunology Allergy Practice* 1991; **13**: 156–8.

Résumé Le but de cette étude était d'évaluer les effets du benzoate de benzyle, un acaricide utilisé pour le contrôle des acariens des poussières, chez 60 chiens sensibilisés aux acariens des poussières. Tous les chiens ont présenté des réactions positives aux tests intradermiques pour divers acariens des poussières (*Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*) seuls, ou aux acariens des poussières et de stockage (*Acarus siro*, *Tyrophagus putrescentiae*, *Glycophagus domesticus*). Des prélèvements de poussière ont été réalisés dans les maisons des propriétaires et envoyés à la clinique, où un test (Acarex® test) a été réalisé pour quantifier semi-quantitativement la teneur en guanine, un produit des acariens des poussières. Le traitement avec le benzoate de benzyle a été répété jusqu'à obtenir une négativation du test. Après traitement, 29 chiens sur 60 (48%) ne présentaient plus de lésion cutanée ou de prurit. Des résultats moyens ont été observés pour 22 chiens (36%), avec une réduction du prurit et des lésions cutanées minimales, mais toujours nécessité d'un traitement. Pour 13 chiens, il s'agissait d'un traitement antifongique, pour 8 chiens d'une immunothérapie. Un chien a été contrôlé par l'immunothérapie associée aux acides gras essentiels. Pour les neuf chiens restant (15%), le prurit n'a pas été amélioré, et ces chiens ont été contrôlés avec des corticoïdes par voie orale. Ces résultats indiquent que l'éviction des acariens est une mesure intéressante pour la gestion des chiens sensibilisés aux acariens des poussières.

Resumen El objetivo de este estudio fue evaluar los efectos del benzoato de bencilo, un acaricida para el control de los ácaros del polvo doméstico, en sesenta perros sensibles a estos ácaros. Todos los perros con reacciones

positivas en las pruebas cutáneas intradérmicas para los ácaros del polvo doméstico (*Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*) únicamente, o los ácaros del polvo doméstico con ácaros del almacenaje (*Acarus siro*, *Tyrophagus putrescentiae*, *Glycophagus domesticus*). Se tomaron muestras de polvo doméstico de las casas de los propietarios y se remitieron a la clínica, donde los autores llevaron a cabo una prueba (Acarex® test) para semi-cuantificar la cantidad de guanina, un producto del polvo doméstico. Se repitió el tratamiento con benzoato de bencilo hasta que las muestras de polvo doméstico fueron negativas para guanina de los ácaros del polvo doméstico. Después del tratamiento, 29 de los 60 perros sensibles al ácaro del polvo doméstico (48%) no mostraban lesiones cutáneas ni prurito. Se consiguieron resultados moderados en 22 perros (36%), con reducción del prurito y lesiones cutáneas mínimas, pero con necesidad de medicación. En 13 perros era necesario un tratamiento regular (3 a 4 veces al año) con antibióticos y medicación anti-levaduras, y en ocho perros se utilizó inmunoterapia. Un perro pudo ser controlado con ácidos grasos esenciales como única terapia y un perro fue controlado con ácidos grasos esenciales e inmunoterapia. En los nueve perros restantes (15%), el prurito siguió igual, y estos perros fueron controlados con corticosteroides orales. Estos resultados indican que la eliminación de los ácaros del polvo doméstico es una herramienta útil para el control de los perros sensibles a los ácaros del polvo doméstico.

Zusammenfassung Das Ziel dieser Studie war, die Wirkungen von Benzylbenzoat, einem Akarizid zur Kontrolle von Hausstaubmilben, bei sechzig Hausstaubmilben-sensitiven Hunden zu evaluieren. Im intradermalen Hauttest zeigten alle Hunde positive Reaktionen auf Hausstaubmilben (*Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*) allein oder auf Hausstaubmilben und Vorratsmilben (*Acarus siro*, *Tyrophagus putrescentiae*, *Glycophagus domesticus*). Es wurden Hausstaubproben aus dem Haus des Besitzers gesammelt und in die Klinik gesandt, wo die Autoren einen Test (Acarex®-Test) zur semi-quantitativen Bestimmung von Guanin, einen Produkt der Hausstaubmilben, durchführten. Die Behandlung mit Benzylbenzoat wurden wiederholt, bis die Hausstaubproben negativ für Hausstaubmilben-Guanin waren. Nach der Behandlung zeigten 29 von 60 Hausstaubmilben-sensitiven Hunden (48%) keine Hautläsionen oder Pruritus. Moderate Ergebnisse wurden bei 22 Hunden (36%) erzielt, welche reduzierten Pruritus und minimale Hautläsionen zeigten, aber noch Medikamente benötigten. Bei 13 Hunden umfasste dies regelmäßige (3- bis 4x jährliche) Behandlung mit Antibiotika und hefewirksamen Medikamenten und bei acht Hunden wurde Immuntherapie eingesetzt. Ein Hund wurde mit essentiellen Fettsäuren als Monotherapie und ein Hund wurde mit Immuntherapie und essentiellen Fettsäuren kontrolliert. Bei den verbleibenden neun Hunden (15%) blieb der Juckreiz gleich und wurde bei diesen Hunden mit oralen Kortikosteroiden kontrolliert. Die Ergebnisse weisen darauf hin, dass die Elimination von Hausstaubmilben ein nützliches Mittel zur Behandlung von Hausstaubmilben-sensitiven Hunden ist.