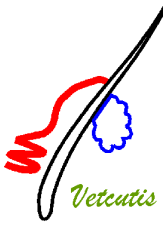
Allergic dermatitis – what is it and what can be done to control it?



Just like their owners, dogs and cats can suffer from allergic dermatitis, known as atopic dermatitis (atopic eczema in man). The exact cause is unknown however it is thought that genetic and environmental factors are involved. Animals with atopic dermatitis are thought to have a defect in the outer barrier of their skin which allows 'allergens' to penetrate the skin and produce inflammation and pruritus. Most animals then develop an allergic reaction to these allergens. An allergy is an immunological response, sometimes inappropriate and extreme which leads to clinical signs of disease. Allergies can vary from a mild dermatitis or conjunctivitis to anaphylaxis and death. Fortunately the latter are very rare in our pets.

The majority of individuals are allergic to more than one allergen however each one can contribute in a minor or major way to the development of clinical disease. We have a concept of a threshold of exposure, above which the pet develops a dermatitis. Exposure to a single allergen may be insufficient to cause the dermatitis, however the effect of small amounts of several allergens can add together and exceed the threshold, producing a dermatitis. The effect is also dose dependent; i.e. the greater the exposure the worse the dermatitis. A very large dose of a single major allergen may also cause a dermatitis.

Skin allergies in cats and dogs can be due to parasites (especially fleas), environmental allergens (in atopic dermatitis, including direct contact) or food. Food can be involved either alone or as one or more of the offending allergen(s) in animals with atopic dermatitis. Dogs and cats are unique individuals and as such it is often better to think of them as multi-allergic with potentially environmental (pollens, housedust mites) and food components involved in their disease.

Atopy is an allergic dermatitis thought to be caused by exposure to a variety of environmental allergens. It is an extremely common condition in dogs for which there is no guaranteed 'cure'. It is currently uncommon in cats but numbers appear to be increasing. The commonest allergens involved are house dust mites, human and animal dander and pollens. The allergens reach the skin directly by contact or inhaled and absorbed into the blood and transferred to the skin.

Atopy leads to a variety of signs however a generalised itchy skin, foot chewing, facial rubbing/scratching, ear problems and a dermatitis along the chest and abdomen are common features.

Allergies cannot be cured and usually some form of lifelong treatment is required.

Atopy is managed by

1) Control of exposure to allergens
2) Therapy directed at controlling the immunological reaction, inflammation and pruritus (itch)
3) Therapy directed at controlling following flare factors:
    a. secondary infections with Staphylococcal bacteria
    b. secondary infections with yeasts (Malassezia)
    c. fleas

Controlling exposure to allergens:

Completely avoiding the exposure to allergens other than food is almost impossible, however reduction of the amount of certain allergens in environment is possible. Bearing in mind the concept of a threshold then reduction of exposure can reduce the amount of dermatitis and complement any therapy.

Allergen avoidance advice:

1. Put your dog out of doors, or in another room, while dusting and vacuuming. Try to keep the dog out of the cleaned room for at least 2 hours after cleaning. The best vacuum cleaners to use are cylinder or solid upright designs; upright vacuum cleaners with cloth bags tend to produce an aerosol of dust.
2. Use a damp duster when cleaning to reduce the amount of dust entering the atmosphere.
3. Your dog should sleep in an un-carpeted room with a bed that can be washed. Wash the bed weekly. If the bed has a stuffing, e.g. a beanbag, then it is wise to cover the bag with polythene; this prevents the build-up of house dust within the bed. Do not allow your dog into your own bedroom or sleep there; this often has the highest concentration of dust and house dust mite in the home. Making your dog sleep elsewhere may lead to a rapid improvement.

4. Prevent the dog from sleeping on a carpet since this contains large amounts of dust. Similarly, keep him away from central heating vents since they are a source of dust.
5. Avoid using perfumes and sprays near your dog although routine flea spraying has more advantages than disadvantages.
6. Do not allow your dog to lie on freshly cut grass, since many individuals dermatitis is aggravated by contact with grass. It is worth looking at your dog's skin before and after contact with grass to determine whether the condition is affected by grass contact.
7. Avoid cut flowers indoors. They produce pollen. House plants and aquariums tend to increase the amount of airborne mould and fungal spores.
8. Do not allow your dog to swim in inland waterways.
9. An ioniser may help to reduce the atmospheric dust.
10. A dehumidifier reduces the amount of house dust mite in the home and may help control the allergy.
11. Regular washing / shampooing physically removes allergens from the surface of the skin thereby reducing absorption (see below).
12. Diet: You may be asked to consider a diet trial as part of the investigation of the allergy. See the food trial / hypoallergenic diet trial information below. Remember that in dogs with allergy involving environmental allergens (e.g. house dust mites/pollens) as well as food, a food trial may not make any difference because the other allergens are sufficient to produce pruritus (itch) irrespective of diet changes. In such cases confirming a food allergy can be almost impossible. Avoiding too many things in the diet is advisable. A simple diet is best with no table scraps.

These management procedures may not control the dermatitis alone however they should reduce the amount of control therapy required.

Therapy:

1) Therapies directed at controlling the immunological reaction, inflammation and pruritus (itch):

A. Immunotherapy. Immunotherapy to induce tolerance is used in man and animals. This involves identifying allergens usually by intradermal skin testing and having a specific vaccine made. This vaccine is then used to stimulate a blocking immunological response in the skin which damps down the allergic response. If this therapy works then it is usually life-long monthly injections or twice daily administration of oral drops onto the mucosa (gums). It has relatively few side-effects in the long-term. Immunotherapy is effective to some degree in up to 70% of cases. The most appropriate individuals for immunotherapy are young dogs and those with a relatively short history of disease and minimal secondary infection. Dogs with chronic atopic dermatitis and recurrent bacterial skin disease have a much reduced chance of responding to immunotherapy. It is important to note that immunotherapy is not effective in controlling flea allergy.

B. Corticosteroids / 'Steroids' (Methylprednisolone or prednisolone). Corticosteroids (not anabolic steroids as used in sport!) are very effective at controlling allergic dermatitis however they have potential side effects when used over a period of years. These side effects are minimised by using tablets on an every other or every third day basis; giving the body a day off helps to reduce the long-term side-effects.

We can also use topical corticosteroids in spray (Cortavance®) and gel (Fuciderm®) formulations

C. Cyclosporine (Atopica®). This drug modifies the component of the immune system involved in the development of allergy. In comparison to man is relatively safe over a long period of time but it is very expensive. The main side effect is vomiting and diarrhoea but both are reduced by administration with food rather than on an empty stomach. Rarer side effects include reversible hyperplasia of the gums and the development of viral papillomas.

D. Tacrolimus (Protopic®). Tacrolimus works in a similar way to cyclosporine. This drug is used systemically and topically in man but is not licensed for domestic animals. We do sometimes use it topically in dogs with localised allergic or immune-mediated disease. We may suggest using it on your dog.

E. Oclacitinib (Apoquel®). This drug was released in 2014 and is a novel molecule which directly blocks activation of nerves responsible for pruritus (itch) by the cytokine IL-31. It achieves this by blocking a surface receptor (JAK-1) on the nerve cell membrane. The clinical trials indicate that side effects are minimal and this may be a revolutionary approach

to pruritus (itch) in dogs and other species. Only time will tell whether this is as effective and safe as the data to date suggests.

F. Lokivetmab (Cytopoint®). This is a caninised monoclonal antibody directed against the pro-inflammatory cytokine IL-31. By binding to this cytokine it renders it inactive. The monoclonal is given by injection every 4 weeks. The data suggests that it is very safe because it is a canine antibody which goes unrecognized by the patient's immune system.

G. Antihistamines: those available are unlicensed in veterinary species and have a beneficial effect in a very small number of dogs. They may be used in combination with immunotherapy or steroids in an attempt to reduce the amount of steroid required and hence minimise side-effects.

E. Essential fatty acid dietary supplementation. These can be given systemically (by mouth) and topically (applied to the skin surface). They come in capsules, pump dispensers and topical pipettes. These should be given to all atopic patients in an attempt to improve the skin outer barrier, the stratum corneum, which is thought to be faulty in dogs with atopic dermatitis.

2) Therapy directed at controlling flare factors (secondary infections with Staphylococcal bacteria and yeasts (Malassezia) as well as flea exposure):

A. Shampoos and topical skin care. Dogs with an allergic dermatitis suffer from inflammation of the skin that results in excessive growth of normal skin bacteria and or yeasts (Malassezia). In some individuals the growth is so great that a bacterial infection, known as a pyoderma, develops and produces as much or more pruritus (itch). Recurrent infection can be prevented by regular shampooing; if I have suggested this to your veterinary surgeon, he/she will dispense a suitable shampoo and conditioner. Moisturising rinses such as Humilac® can be sprayed onto the skin at the end of washing or used as a final rinse to seal in the moisture achieved during bathing.

B. Systemic therapy for bacterial pyoderma and yeast (Malassezia) infection. In some cases topical therapy is insufficient to bring bacterial and yeast infections under control. Courses of antibiotics (tablet or injection) may be required intermittently in dogs with atopic dermatitis. Occasionally Malassezia infection needs systemic therapy in additional to topical washes / shampoos; we may use antifungal agents on two consecutive days a week to control Malassezia skin infection including those in the external ear canal.

C. Flea control. Many patients with atopy will develop flea allergic dermatitis if exposed to flea bites; many dogs have both conditions together. It is important to have a good flea control program involving treatment of your house, where they breed, and on your dog, where they feed. Talk to your Veterinary Surgeon about the products available for flea control.

Conclusions:

Allergic dermatitis is common in our pets. Generally speaking the dermatitis can be controlled however cure is not possible at this time. Please read the summary of the reference from Veterinary Dermatology (2010 below)

Atopic dermatitis - Immunotherapy

Once a diagnosis of atopic dermatitis has been made on the basis of your pet's clinical signs and history there are various means of control and treatment available. All of these are used long-term and no complete cure is currently available. Intradermal skin testing indicates the common allergens (e.g. house dust mite, pollens) causing the dermatitis. Assuming that positive responses are obtained during the skin testing, a specific 'vaccine' can be produced for your dog or cat. This 'vaccine' is used to suppress your pet's allergy. This process is called immunotherapy or desensitization and induces tolerance. It is considered the most satisfactory and safest means of control available for pets with atopic dermatitis.

What is involved in the process of Immunotherapy?

The 'vaccine' is produced specifically for your own pet and contains up to 8 allergens. The 'vaccine' is given into the skin in the same way as annual boosters. The volume administered increases over a period of weeks (the induction phase) until a 1ml volume is given every 4 weeks (maintenance).

The Artuvetrin® immunotherapy protocol used is:

Induction:	
Day 1	0.2ml
Day 15 (week 2)	0.4ml
Day 29 (week 4)	0.6ml
Day 43 (week 6)	0.8ml
Day 64 (week 9)	1.0ml
Day 85 (week12)	1.0ml
Maintenance;	
Day 113 (week 16)	1.0ml
Day 141 (week 20)	1.0ml
Every 4 weeks there after	

Your veterinary surgeon will give the first few injections (for which there is usually a charge).

How long will it take to work?
Most individuals respond to immunotherapy within 6 months however some individuals do not respond until 6-12 months. Unless you are keen to continue with the immunotherapy we normally suggest that if your pet has not responded by the end of the first 10ml vial it is unlikely to do so. In this case other means of control have to be employed.
Other forms of control such as oclacitinib, cyclosporine or antihistamines can be used during the induction phase and maintenance phase of immunotherapy. We try to avoid using corticosteroids at the same time as immunotherapy but this cannot be avoided in a small number of cases.

Does it work in all animals with atopic dermatitis?
Not all cases respond to immunotherapy. In 33% of cases there is a very good response to immunotherapy and no other treatment is required. In a further 33% of cases there is a response (as perceived by the owner) although some other forms of therapy are also required; this may vary from regular shampooing to antihistamines or, in the worst cases, corticosteroids. In the final 33% of cases the immunotherapy is not perceived as having any effect. The reason for this is not clear; dogs with long-standing disease and secondary bacterial or yeast infections are more likely to fall into this category. The best candidates are young individuals who have not got or had any secondary infections and do not have flare factors such as fleas.

Are there any side effects with immunotherapy?
As with all procedures and medications there are risks, although small, with immunotherapy. A very small number of individuals react to the intradermal skin testing or to the immunotherapy injections. These reactions when they occur tend to be mild. Severe, life-threatening anaphylactic reactions can occur, however these are very rare. As with other routine procedures such as annual vaccinations or the use of routine wormers and antibiotics the risks of anaphylaxis due to immunotherapy are small. In comparison to the use of long term corticosteroids and their side effects in the control of atopic dermatitis the risks of immunotherapy are very low. If you feel that your pet has had a reaction please contact your own veterinary surgeon immediately.

Long term management
All animals with atopic dermatitis, even those successfully controlled by immunotherapy have occasional relapses which are usually associated with flare factors such a fleas or microbial infection. Apart from routine flea control, microbial infections will require treatment as and when they occur.

Terminology
‘Allergen’ is the molecule (or antigen) which causes the allergic reaction.
‘Immunotherapy’ is also known as ‘desensitisation’ or ‘hyposensitisation’. Immunotherapy is thought to stimulate 'tolerance' of allergens previously responsible for an allergic reaction

REFERENCE:

‘Treatment of canine atopic dermatitis: 2010 clinical practice guidelines from the International Task Force on Canine Atopic Dermatitis’. Vet Dermatology (2010)

Vet Dermatology 2010 Jun;21(3):233-248

ABSTRACT

Atopic dermatitis (AD) is a common chronic relapsing pruritic skin disease of dogs for which treatment has varied over time and geographical location. Recent high quality randomized controlled trials and systematic reviews have established which drugs are likely to offer consistent benefit. The International Task Force for Canine AD currently recommends a multi-faceted approach to treat dogs with AD. Acute flares should be treated with a combination of nonirritating baths and topical glucocorticoids, once an attempt has been made to identify and remove the suspected causes of the flare. Oral glucocorticoids and antimicrobial therapy must be added when needed. In dogs with chronic AD, a combination of interventions should be considered. Again, **factors that trigger flares of AD must be identified and, if possible, avoided. Currently recognized flare factors include food, flea and environmental allergens, *Staphylococcus* bacteria and *Malassezia* yeast. Skin and coat hygiene and care must be improved by bathing with nonirritating shampoos and dietary supplementation with essential fatty acids**. The severity of pruritus and skin lesions can be reduced with a combination of anti-inflammatory drugs. Currently, medications with good evidence of high efficacy include topical and oral glucocorticoids, and calcineurin inhibitors such as oral ciclosporin (Atopica) and topical tacrolimus (Protopic). The dose and frequency of administration of these drugs should be tailored to each patient considering each drug's efficacy, adverse effects and cost. Allergen-specific immunotherapy should be offered, whenever feasible, in an attempt to prevent recurrence of clinical signs upon further exposure to environmental allergens to which the patient is hypersensitive.

CONCLUSION:

In summary, the **treatment of canine AD must be individualized for each patient**. Treatment regimens should depend principally upon whether veterinarians are treating acute flares or chronic skin lesions of AD, and whether signs are localized or generalized. Treatment of chronic canine AD is most challenging and should incorporate a combination of detective work to identify flare factors, elimination of these factors (if feasible), optimization of skin care, reduction of skin lesions and pruritus and prevention of recurrence of signs after remission. **Not all interventions will be suitable for every patient; drugs will not be equally effective for, or tolerated by, every dog**. Veterinarians are encouraged to abide by the evidence-based medicine principles highlighted in this review. They must also, at the same time, follow pet owners’ preferences – which includes the cost and ease of the various interventions – and, ultimately, consider the quality of life of each patient in the context of the recommendations described herein.

Future concepts and strategies. The authors note that, as of the time of this writing, several therapeutic interventions for canine AD are under active study and might be promising candidates for future recommendations. For example, drugs that inhibit the tyrosine kinase family of enzymes are under study for use in both neoplastic and inflammatory conditions, including canine AD. In addition, there is active discussion over the possible benefit of improving epidermal barrier function (via a dietary supplement or topical means) in dogs with AD. Methods to study barrier function, and the influence of such therapies on canine skin, are under active development. Results from clinical trials in dogs with AD have yet to be reported for these different interventions, but the theoretical concepts provide reason for hope that additional tools in our arsenal against canine AD might be available in the future.

Elimination diet trial

Animals may develop sensitivity to components in the diet either alone or with other causes such as those associated with atopic dermatitis or atopy (e.g. house dust mites, pollens). It is therefore important to consider the role of food allergens (these are the components which cause the allergic reaction) in animals affected by allergic skin disease as well as other possible triggers (environmental allergens e.g. house dust mite). The preferred method of investigating food allergy is to feed a novel or limited diet (trial or hypoallergenic diet) for a 6 – 8 week trial period. Food allergy develops over time and therefore usually involves an ingredient(s) present in the diet for some time and not an ingredient which has been recently introduced.

At the end of the trial diet period, if the skin disease improves, the original diet is re-introduced in order to confirm that something in the original diet is the cause. The skin disease in dogs with food allergy should improve or resolve whilst on the trial 'hypoallergenic diet' and recur once the original diet is re-introduced.

There are three acceptable approaches to an elimination or hypoallergenic diet trial:

1) Novel protein diet which is a commercially prepared diet which contains a protein your pet has not previously eaten.
2) Hydrolysed diet which is also commercially prepared but undergoes a process which breaks the protein into smaller units. The theory is that the smaller protein particles pass through the gut without triggering an allergic reaction.
3) Home cooked diet where a simplified diet containing a protein and a carbohydrate is prepared at home. Ideally the protein and carbohydrate sources should be novel for your pet. Water can be used for cooking but no flavourings or supplements can be added for the duration of the trial period.

The guidelines given on commercial diets should be referred to and your pet fed the amount suggested for its own weight. Only water should be offered to drink. Any change in diet should be introduced gradually over a 3 – 5 day period. It is important that all treats should be stopped and if you feel you must feed at times other than a main meal, small amounts of the trial diet can be given. Other foodstuffs which must be avoided for the trial period include:

- Titbits given with medications. Medications should be given alone or with some of the trial hypoallergenic diet.
- Some medications are flavoured and may need to be changed to an alternative type.
- Pet toothpastes are often flavoured and may need to be avoided.
- Some toys may be impregnated with flavourings.
- Chews, scraps and bones should not be given for the duration of the diet trial.
- "Hypoallergenic" treats are widely available but may not be compatible with the trial diet.

It is helpful if all family members and other people who come into contact with your pet are fully informed of the requirements for the trial diet. Although these rules may seem strict, remember that it is only for a limited time and the information gained can be very valuable for the successful management of the animal's skin problem.

'Must do' list for controlling Canine Atopic Dermatitis

Your dog has atopic dermatitis so you should:

1. Make an effort for reduce allergen exposure indoors and out

2. Use one or more of the standard therapies to control the allergic reaction and pruritus

- Immunotherapy
- Corticosteroids
- Cyclosporine (Atopica®)
- Oclacitinib (Apoquel®)
- Lokivetmab (Cytopoint®).
- Antihistamines (chlorpheniramine etc)

3. Keep the skin clean by regular washing and conditioning the skin to reduce allergen exposure and reduce secondary infections.

- Malaseb® - for bacteria and yeast
- Etiderm® shampoo - for bacteria
- Chlorhexidine shampoo - for bacteria and yeasts

4. Keep the diet simple or use a 'low allergen' / 'selected protein' / 'hydrolysed' diet in case food components are involved in triggering pruritus (itch) along with environmental allergens

5. Give an oral (plus topical if you wish) essential fatty acid supplementation to help improve the outer barrier of the skin. Examples are:

- Efavet® capsules
- Viacutan® capsules and pump dispenser
- Yumega®