

# DEALING WITH ALLERGIC PATIENTS

**ALLERGIES** are one of the consequences when the immune system fails to recognise usually harmless substances and instead attacks materials such as pollens and proteins from various sources.

Clinical signs range from nasal and sinus congestion, sneezing, coughing, gastrointestinal problems, skin rash and pruritus, as well as behavioural changes.

In cats and dogs pruritus is the most commonly observed clinical sign, whereas horses display mainly COPD-like symptoms, urticaria and sometimes head shaking. In show and racehorses, just like in working and racing dogs, this leads to an undesired, impaired performance and lack of concentration.

## Reaction to allergens

The classic form of allergy is an immediate reaction, meaning it can be observed within approximately 30 minutes of contact. However, delayed reactions observed within hours or days are also possible and are usually referred to as intolerance.

A type I hypersensitivity sensation is characterised by a tissue reaction, which causes various inflammatory mediators to be released. This, in turn, results in the observed clinical



Horse with sweet itch (*colicoides hypersensitivity*)

## PETRA WESCHE

DVM, MSc, (Wild Animal Health), MRCVS

of Greendale Veterinary Diagnostics outlines the diagnostic and treatment options for the increasing numbers of patients suspected of being allergic in this week's special feature

symptoms.

Anaphylactic reactions to specific allergens are the most severe systemic reaction and pose an emergency. It is rarely observed in animals. The main shock organs of animals are the gastrointestinal tract and the skin and this is where we see most of the reactions.

## Groups of allergens

Environmental allergens are airborne particles containing many different substances, but the allergic component comprises of a protein structure of between 10-70kD and 2-6 µm. This size enables the particles to penetrate mucous membranes.

When sufficient amounts are available, typical symptoms such as pruritus and respiratory distress can be detected. Most environmental allergens occur with seasonality.

Desensitisation or immuno-therapy works under this limit and the objective is to challenge - but not to overwhelm – the immune system.

Pollens are needed for the reproduction of seed plants such as grasses and weeds and are most abundant during the growing season. It is presumed that these are responsible for about 10-30 per cent of all IgE-induced allergies in humans.

Most temperate zone grasses, with the exception of Bermuda grass, have some

allergenic protein cross reactivity.

Some antigens are common throughout the entire grass family.

The Compositae family is the most significant allergy group of weeds. It includes the ragweed tribe, which is responsible for the majority of human hay fever cases in the US

Tree pollination time is generally short and tree allergens are considered to be of less significance than either grasses or weeds.

Moulds are ubiquitous and particles are distributed depending mainly on weather conditions. Further environmental allergens include dust, dander, feathers, fabrics. etc

## Differential diagnoses

The list of differential diagnoses can either be short or extensive, depending on the history given and the clinical signs observed during the consultation. Before embarking on allergy testing it is important to give the patient a full clinical examination.

This should include basic examination, skin scrapings, hormone testing and possible biopsies which are, in themselves, not diagnostic, but supportive in the diagnosis.

Haematology is usually inconclusive for diagnosing allergies, but a general blood profile helps to determine the general health status of the patient and eliminates possible underlying systemic disorders.

Dogs in particular seldom show eosinophilia.

Presumed or confirmed secondary infections due to bacterium or yeasts should be treated appropriately. This should cause the clinical signs, such as



West Highland white terrier with atopy and secondary microbial infection (grade four)

pruritus, to lessen, but should not totally eliminate them.

Much like in humans, there appears to be a familial occurrence of allergies in pets and horses, most notably sweet itch (*Culicoides* hypersensitivity).

Just like in humans, immuno-compromised animals usually show a positive reaction towards more than one allergen, as the complex is multifactorial. Therefore, it may prove to be false economy to test for only one or a few allergens rather than a comprehensive profile. It is vital that the chosen profile is suitable for your geographical region and the performing laboratory should be contacted regarding this.

Secondary infections such as pyoderma caused by bacterium or fungi/yeasts are common due to the animal itching and should be treated separately. A work-up on hormonal imbalances and review of nutritional deficiencies is also recommended.

In dogs it is estimated that about 15 per cent of the population suffers from allergic reactions which can severely compromise the well-being of the animal.

### Test methods

- **Intradermal.** In the past, the main diagnostic tool for detecting allergic disease in pets and horses has been

the skin or intradermal test.

Drawbacks of this procedure are that it is time-consuming and often requires sedation and the careful removal of hair. Limitations are observed with lichenified, inflamed and hyperpigmented skin. If not used regularly, the allergens are likely to expire before they are used up therefore, it may be uneconomical to run the test in the general veterinary practice.

Results are often conflicting and controversial, as false positive findings may be observed due to various problems such as improper technique and trauma, existent urticaria, demographism and contaminated allergens.

False negative results may be due to poor technique (sub-cutaneous rather than intradermal injection), stress, recent anti-inflammatory therapy and other drug interferences and inherent host factors, as well as out-of-date or poorly maintained allergens.

- **Serology.** Two different serological methods, the RAST and the ELISA, are used to determine the amount of allergen-specific antibody within the patients' serum. Species-specific anti-immunoglobulin must be used and, therefore, the commercial test is currently only available for canine, feline and equine species

Serological procedures cause less stress for the animal and are quicker than the intradermal test, and experiences less interferences from antihistamines and steroids in comparison with the skin test.

One needs to know that polyclonal anti-IgE components can also detect IgG, which leads to a over specificity of the test, and monoclonal IgE tends to be more specific, but less sensitive.

Therefore it is best to use a recombinant IgE receptor molecule in order to obtain best results, which can be compared to the intradermal test.

Horses have large amounts of mast cells within their skin and, therefore,

often show a dramatic response to the skin test.

This is due to the level of circulating IgE in the serum, which is directly correlated to the allergic reaction. Food allergies are often concurrent with environmental allergies and can be tested for by serology as well, but there are few papers published to explain their usefulness. Treatment is at present not available and avoidance by specific dietary food choices based on test results and provocative testing is the only recommendation.

### Treatment

While avoidance would obviously be the best form of treatment for all allergies, this is often difficult and usually impossible to obtain.

Corticosteroids, anti-histamines and other symptomatic treatments provide short-term relief, but prolonged treatment can often not be recommended due to the well-known adverse side-effects of some of these medications.

Hyposensitisation (or desensitisation) is the preferred form of treatment. Based on the test results, injections containing specific amounts of the determined allergens are administered at designated intervals. This allows the animal to build-up a tolerance to the offending substance(s) and reduce the degree of irritation, especially during the allergy season.

The most commonly-used route of injection in immuno-therapy is subcutaneous. This method proves to be safe, quick and simple.

Intradermal injections allow a slower absorption of allergen, but care has to be taken as smaller doses are applied. It is also more painful and technically more demanding.

Other routes of administration are inhalation, oral or intra-lymphatic (in humans).

In general, treatment may be applied co-seasonal, pre-seasonal and perennial. The latter involves year-round administration and permits the

largest cumulative dose of antigen. However, since most veterinary patients do not significantly improve before two or three months have passed, a year-long therapy currently appears to be the most appropriate and successful method of treatment. Likewise the success rate is not compromised by the time when the immunotherapy is started, but it is recommended to start desensitising seasonal allergies before the onset of symptoms.

Unfortunately, allergies are rarely - if ever - cured and the success depends on the precision of diagnosis and adherence to the prescribed course of treatment. Long-term immunotherapy carries no reported adverse effects, however, compliance with the schedule is vital for success. As the immune system is compromised in allergic animals it is recommended to re-test animals after approximately three years in order to maintain a good control of the allergenic status of the animal.

### Reactions to treatment

- Local reactions. Small areas of erythema and swelling which disappear fairly quickly may be observed, but are of no concern. Larger, persistent reactions, with considerable discomfort, which occur within 30-60 minutes of the injection should, however, be a cause for concern. Exclude false injection techniques and contamination issues. The supplier of the immunotherapy should be contacted to discuss appropriate adaptation, such as reducing or diluting dosages and administration of local antihistamines
- Systemic reactions. Very rare and occur within 30 minutes of injection. The animal be treated immediately as needed, further injections should be suspended and the supplier should be contacted for advice.

### Which patients qualify for immunotherapy?

- The patient should have a history of incidences and symptoms associated



German shepherd dog with atopic dermatitis and Pyoderma.

with allergy and must have undergone a full clinical exam in order to exclude other diseases. Secondary infections such as staphylococcal pyodermitis should have been treated and symptoms related to allergies must still be present. The patient must have demonstrated specific IgE reactions- either in the intradermal or serological test - to the allergen(s) in question.

### Which patients do not qualify for immunotherapy?

- Animals where no specific reaction to allergens has been proven.
- Patients in which only food allergies have been demonstrated, as no desensitisation is currently available.
- While not yet proven, it is probably advisable to defer from desensitising patients, which suffer concurrently from immunopathologic conditions or malignancies.

### Improvement

Improvement is individual and depends on the longevity of the problem, the age and immuno-logical status of the animal, and many other factors. Immunotherapy vials build-up in strength and, therefore, most animals will not show immediate results. In general, it can be expected to see improvement during the first six months, but some animals will take between nine and 12 months. If after this time no improvement is seen the animal should be re-evaluated. Possible causes could be related to insufficient work-up on the case and

false choice of allergens.

### Allergen preparation and stabilisation

Manufacturing procedures vary between laboratories. Loss of potency is related to time, temperature, allergen concentration, the preservative used and interfering substances.

The issuing manufacturer should thoroughly examine all productions for sterility.

### Conclusion

Veterinarians are increasingly being confronted with patients suspected of being allergic. A full clinical examination and the exclusion of other causes are essential. Tests available for diagnosis are either the intradermal test or serology. If applied correctly both can yield good results.

Immunotherapy can be formulated according to positive results. Success rates are good if thorough investigation has preceded the test and appropriate allergens have been chosen. Once started, improvements should be seen within nine or 12 months and, in most cases, treatment will be for life.

It is recommended that patients are re-checked as new allergies may develop in immuno-compromised animals.

- **Petra Wesche can be contacted at Greendale Veterinary Diagnostics: telephone 01483 797707; fax: 01483 797552; e-mail lab@greendale.co.uk.**