

AVIAN ALLERGIC SKIN DISEASE

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INTRODUCTION

A great deal of controversy surrounds whether or not allergic skin disease actually exists in birds. Many reports of allergic skin disease are anecdotal and little research has been done in this area.

AVIAN IMMUNOLOGY

The avian immune system is similar in some ways to that of mammals – cells such as heterophils (the avian equivalent of the neutrophil), B and T lymphocytes, basophils and eosinophils can all be identified. Avian eosinophils, however, are thought to be associated more with allergic disease than parasitism (Gerlach, 1994).

Three groups of immunoglobulins have been identified in the avian immune system – namely IgY, IgA and IgM. IgY is often called IgG, but it has been shown that IgY does not have the same structure as that of mammalian IgG (Warr, Magor & Higgins, 1995). IgE has not been demonstrated in birds and it has been suggested that IgY can take on the role of IgE in hypersensitivity reactions (Warr, Magor & Higgins, 1995). Mast cells are present in avian skin and it is possible that mast cell degranulation is involved in hypersensitivity reactions. Indeed, Type 1 hypersensitivity reactions have been documented in pigeons and asthma like syndromes have been reported in South American Psittaciformes (Wallis, 1987).

CLINICAL SIGNS

Identification of pruritus in birds can be difficult (Cooper & Harrison, 1994). Clinical signs such as feather chewing, feather plucking and possibly foot chewing are thought to indicate pruritus. However, systemic disease and behavioural problems are thought more common causes than allergic disease.

Seasonal problems, or response to treatments such as corticosteroids, antihistamines or fatty acids have also been put forward in support of allergic disease (Macwhirter & Mueller, 1998).

DIAGNOSIS

As with allergic skin disease in mammals, a diagnosis of avian allergic skin disease often relies upon ruling out other possibilities. In the case of feather plucking systemic diseases such as Giardia and behavioural problems need to be excluded.

Intradermal skin testing has recently been used in birds as a means of diagnosing allergic skin disease (Macwhirter & Mueller, 1998, Macwhirter, Mueller & Gill, 1999, Colombini and others 2000, Foil and others 2001).

IDST in birds however, is not without problems. Firstly, there is only a limited area of skin available for injections. In order to avoid removing feathers, the apteria should be used. Feathers can be moistened with alcohol to hold them out of the way (ensuring that the birds is kept warm throughout the procedure). The apteria on either side of the sternum have been used in published papers and provide the largest area.

Avian skin resembles that of cats in a number of ways. The skin itself is very thin and great care needs to be taken when placing injections. Colombini and others (2000) found that 0.02ml was the ideal volume to inject using a 30 gauge needle. The response to injections is short lived and should be read 5 minutes after injection.

Histamine, codeine phosphate and compound 48/80 have been used as positive controls (Macwhirter & Mueller, 1998, Colombini and others, 2000), based on their use in dogs (Mason & Lloyd, 1996, Colombini and others, 2000). Histamine has not proved a good positive control in birds, with a poor inflammatory response. The best positive control agent was found by Colombini and others (2000) to be codeine phosphate at a concentration of 1:100 000 w/v.

Various reasons have been forward for the poor response of histamine. Results of intradermal skin testing in birds has a lot of similarities to that of cats and it has been suggested that birds have high levels of circulating corticosteroids (similar to those of cats) during IDST which dampen the response to histamine (Willemse and others, 1993, Heatley and others, 2000).

Choice of allergens should be based on the bird's environment. Macwhirter & Mueller (1998) observed positive reactions to sunflower, house dust mites (*Dermatophagoides pteronyssinus* and *D. farinae*), maize, grain mill dust. Due to the limited area available for injection, allergens should be chosen with great care. It was also suggested that cross reaction between dietary ingredients such as sunflower and pollen may be possible.

Macwhirter and Mueller (1998) compared clinically normal and self mutilating birds and found a significant difference between the two groups in their response to IDST. 93% of self mutilating birds reacted to at least one environmental allergen whereas only 2% of clinically normal birds reacted to these allergens. This would support the existence of allergic skin disease in birds.

Biopsies have also been used in the diagnosis of allergic skin disease, but often the results can be non-specific (Schmidt, 1993).

No reports of serological testing of suspected cases of allergic skin disease have been published to date.

TREATMENT

Treatment of avian allergic skin disease is difficult. Avoidance of the inciting agent is useful if possible. Cleaning the environment to reduce allergen build up and even hand washing prior to handling have been suggested as being of some use (Welle, 1999). Glucocorticoids have been used but due to their side effects should be used with caution. Antihistamines and omega- fatty acids have also been used, but with limited success.

Dietary changes may help the condition, but whether this is due to a dietary hypersensitivity or an increase in the omega-3 fatty acid concentration of the diet needs further work.

CONCLUSION

It would appear that allergic skin disease does exist in birds but is fairly uncommon. Intradermal skin testing can be used in the diagnosis of this condition, but can be difficult due to the nature of avian skin and the poor reactions that are observed. More work is needed though to find out the immunological basis of allergic skin disease and in the treatment that can be used once a positive diagnosis has been made.

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