

ABC OF ALLERGOLOGY

AERO-ALLERGEN AVOIDANCE MEASURES – EFFECTIVE OR FUTILE?

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Allergen avoidance is recommended as a first-line intervention for all individuals with allergic asthma and allergic rhinitis. However, there are practical difficulties in avoiding many allergens which limits the effectiveness of this approach.

One must therefore ask the question: *Are currently available aero-allergen avoidance measures effective?*

Evidence that limiting allergen exposure will reduce morbidity and mortality from asthma is tenuous according to most national and international asthma guidelines.¹ There is also very little robust evidence that allergen avoidance is effective in treating allergic rhinitis. Most controlled studies have specifically examined the effect of house-dust mite avoidance measures in people with asthma, and these study results have generally been disappointing.²



A systematic review and meta-analysis identified four studies totalling 122 subjects which examined the effect of house-dust mite avoidance in people with persistent (perennial) allergic rhinitis.^{3,4} The trials included were small and judged to be of poor quality. In these studies, the load of house-dust mite allergen was reduced significantly by physical and chemical means compared to controls. But what was disappointing is the fact that there was little evidence that the reduced allergen load had any clinically significant improvement in either allergic asthma or rhinitis symptoms. Although the beneficial effect of allergen avoidance in people with allergic asthma and rhinitis was considered poor, this could reflect a lack of good quality trial evidence rather than any true negative study results.⁴ Therefore house-dust mite allergen avoidance is still recommended as a first-line intervention strategy by most allergy and respiratory opinion leaders.

What practical advice can be given on allergen avoidance?

Unlike the agreement reached in asthma and allergic rhinitis medication protocols, the opinion leaders are in conflict when it comes to the efficacy of specific allergen-avoidance measures. This is because it is not usually possible to completely avoid aeroallergens such as house-dust mites, cat dander and pollens. However, reducing exposure may lessen the severity of symptoms and minimise the need for drug treatment of allergic rhinitis according to Dykewicz *et al.*⁵

But any benefit obtained by using a single house-dust mite intervention to improve symptoms was questionable. According to Egglestone *et al.*⁶ in 2005, efforts to obtain maximal mite elimination may lead to clinical benefits in selected highly motivated patients and clinical

benefits are more likely when multiple interventions are implemented at the same time.¹

But Woodcock *et al.*⁷ claimed in 2003 that interventions to control house-dust mite allergens did not appear to be a cost-effective method of treating allergic asthma, and they felt at the time that there was no clear benefit from the available house-dust mite avoidance measures.⁷

This concern has been echoed over the years by thoracic and allergy societies around the world, including the British Thoracic Society, which claims that the evidence for reducing allergen exposure so as to reduce morbidity and mortality in asthma is at best tenuous.

There are a variety of techniques currently available to reduce exposure to allergens: persistent allergic rhinitis is often caused by allergies to house-dust mites and animal dander, which can be reduced by cleaning techniques, using special covers, etc. There have consequently been a number of studies looking at various house-dust mite interventions (Table I). Animal allergens, particularly cat and dog allergens are potent inducers of asthma symptoms, but observational studies have not found that removing the pet from the home improves asthma symptoms. Nevertheless, many experts would still recommend as a first-line measure to remove all pets from the home of an allergic individual with asthma (Table II). However, no well-conducted trials have been done to examine whether measures to reduce cat allergen levels actually lead to clinical improvement in cat allergic rhinitis, as it takes several months for the cat allergens to disappear from a home once the cat has been removed. Therefore according to Colloff *et al.*⁸ trials of brief cat removal from the home have been shown to be ineffective.

Table I. House-dust mite eradication (grade of recommendation D¹)

In committed families who wish to try house-dust mite avoidance, the following are recommended when there is allergy test evidence of house-dust mite allergy in a family member:

- Encase mattress and pillows completely in plastic or special allergen-proof fabric
- Hot wash bedding at 55°C
- Replace carpets with wooden floors
- Minimise objects that accumulate dust
- Remove soft toys from bed as they harbour mites
- Remove upholstered furniture and replace with leather, plastic or vinyl
- Application of acaricides (chemical agents that kill mites) to soft furnishings
- Dehumidification and do not dry clothing indoors
- Remove infrequently used clothing from the bedroom

Other measures which may or may not be effective include:

- HEPA filtration systems on vacuum cleaners and air cleaners
- Damp wiping down of all bedroom surfaces
- Synthetic fill to pillows and duvets and avoiding feather fills

Remember house-dust mites need a warm humid indoor environment with plenty of human skin scales to eat!

Grade of Recommendation D = expert opinion but not subjected to systematic review.

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Table II. Cat avoidance measures (grade of recommendation D¹)

Remove cat, followed by thorough cleaning of house, steam cleaning of walls and shampooing of carpets
 Keep cat out of bedroom and other commonly used rooms
 Wash cat weekly
 Remove all carpets and replace with hardwood floors and clean regularly
 Air filtration units in rooms where the patient spends the majority of their time
 Increase ventilation with fans, air-conditioners or by opening windows
 Measures that may not be beneficial

- Use of indoor ionisers
- Restricting the cat's movement within home
- Temporarily removing the cat from the home

It takes many months after the cat has been removed for airborne cat allergen levels to fall. The cat allergen (Fel d 1) is transported from room to room on clothing and in the air flow.

Grade of Recommendation D = expert opinion but not subjected to systematic review.



Allerca cat and Bichon Frise dog.



Bashkir Curly horse.

Some furry pets shed less dander than others so may appear to be 'hypoallergenic' and are better tolerated by allergy sufferers (Table III). There is only one breed of North American horse called a Bashkir Curly which seems to lack the allergy-provoking horse protein in its coat

and may be truly hypoallergenic. In 2006 a new breed of cat called Allerca was purported to lack Fel d1, the cat allergen, but no peer-reviewed studies have been done to confirm this. No canine breed is currently known to be completely allergen-free.

Table III. Pets that are reported to shed less allergen and dander

Cats: Siberian and Russian Blue, Devon and Cornish Rex, Sphinx and a new breed 'Allerca'
Dogs: Most terriers and poodles, as well as Schnauzer, Portuguese water dog, Chihuahua, Shih Tzu and Bichon Frise.
Hypoallergenic horse: Bashkir Curly

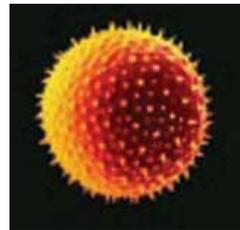
Intermittent allergic rhinitis (hay fever) is usually caused by pollen, which is very difficult to avoid when outdoor pollen levels peak in summer. Nasal filters have been shown to reduce symptoms of allergic rhinitis and allergic conjunctivitis during ragweed and grass pollen seasons.⁹ This observation was interesting as nasal allergen provocation seems to play an important role in generating allergic conjunctivitis. A number of other measures have been advocated to reduce hay

Table IV. Pollen avoidance measures (grade of recommendation D¹)

- Avoid outdoors on high pollen days especially late morning and early evening.
- Wear wraparound sunglasses out of doors; consider wearing a nasal air filter.
- Apply a little Vaseline to the lower nostrils to trap pollen and reduce irritation.
- Avoid mowing grass or being outdoors when grass is being mowed.
- Keep windows closed at home and in the car; rather use air conditioning.
- Bathe eyes and douche nose frequently with a dilute salt solution.
- Avoid hanging washing out when pollen levels are high.
- Shower and wash hair on arriving home at end of day.
- Plan holidays to avoid being present during the pollen season.

BSACI guidelines suggest a small intranasal air filter (see www.nasalaiguard.co.uk) (grade of recommendation B¹)

Grade of recommendation D = expert opinion but not subjected to systematic review. Grade of recommendation B = subjected to high quality systematic review.



Pollen granule.

fever symptoms but these are based on expert consensus rather than clinical trial data (Table IV). However, daily pollen counts are forecast and can be used to predict when hay fever is likely to be worst. The patient can then prepare for this eventuality by adjusting their daily activities (to avoid outdoor work), or by taking prophylactic antihistamines.

Declaration of conflict of interest

Dr Morris has done consultancy work for British Broadcasting Corporation UK, Boots Pharmacies UK, UCB Institute of Allergy, Belgium, Observer newspaper London, as well as GlaxoSmithKline, Pfizer and Kimberley Clark UK. He is currently involved with a clinical trial for Novartis (SA).

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