

Dust and Allergy

Dr. S. Sreeremya

Faculty of Biology

Department of Biology Science

Academy of Science, Palakkad, Kerala, India

Corresponding author's email id: sreeremyasasi@gmail.com

Abstract

Dust is a polluting agent which causes major pulmonary disorders which initially starts from coughing to chronic clinical conditions. It can cause eye infections too. This paper discusses the mode of infections manifested by dust as allergen.

Keywords: - Polluting agent, Dust, eye infections, pulmonary disorders, clinical

INTRODUCTION

Dust mites are present in all the households, no matter how clean. They do not live on the humans but live in the bedding, upholstered furniture, carpet and stuffed toys. They live in warm, humid places and feed on the dead skin cells that fall off of the human body. If dust mite waste particles are inhaled or mainly come in contact with skin of a person who is allergic, they may cause runny nose, itchy eyes, it can also leads to stye (Sreeremya, 2018), cough, wheezing and the skin itching(Rosenstreich et al.,1997).

Dust Mite Facts (Chew et al., 2009)

- Dust mites live in the beds and furniture.
- Dust mites need to feeds to stay alive.
- Dust mites live in the warm, humid places.
- Dust mites do not live in air ducts in homes. Duct cleaning will not decrease numbers of dust mites. Filters on the heating/cooling systems or the vents will not control the dust mites though will help reduce dust in the home.

- Cleaning is helpful to decrease the amount of dust but will not change the source or numbers of dust mites.
- Chemicals and sprays are not needed and will not have the lasting effect on the number of dust mites. They can also be harmful to family members with asthma.
- Wash blankets and the stuffed toys twice a month in hot water and dry in the hot dryer. Water temperature needs to be at least 120° Fahrenheit.
- Humidity level in the home should be less than 52%. Use a dehumidifier or air conditioner if needed. An inexpensive hygrometer can be purchased at any hardware store to keep the track of humidity in the home (Sporik et al., 1995).

Dust Mite Control

The best way to control the reactions to dust mites is to not be exposed. Unfortunately, it is hard not to come in contact with them. It is possible to decrease the amount of exposure by making certain changes, especially in the bedroom (Charpin et al., 1991).

Controlling Dust Mites

- Enclose mattresses, box springs and pillows in zippered, dust mite proof covers. The cover label should list protection against dust mite allergens. The fabric weave should be 2-12microns, though this is not always listed (Sporik et al., 1998).
- Wash sheets and the pillow cases weekly in the hot water and dry in a hot dryer.
- If you have the carpet, vacuum weekly, using a high efficiency filter bag.
- Wood or vinyl floors are better than the carpet.
- If the dust mite allergic person has to do the vacuuming, a mask should be worn.
- Stuffed animals should be washable in the hot water.
- Limit clutter in the bedroom.
- All dusting should be done with a damp cloth.
- Use window blinds that can be wiped down, rather than curtains.

DUST MITE ALLERGY

Allergy to house dust mites is very common and can trigger allergic reactions such as asthma, eczema and rhinitis. Cutting down mite numbers may reduce these reactions (Peters et al., 2009).

HOUSE DUST MITES

House dust mites are the creatures which are so small that they cannot be seen with the naked eye. They live in all our homes and feed majorly on the scales of skin that we shed. They are most common in warm, damp areas where dust containing skin scales gathers. These areas encompass pillows, mattresses, carpets, soft furnishings, soft toys and even clothing. The mites are harmless to most of us but they can mainly cause allergic symptoms in some people (De Lovinfosse et al., 1994). These symptoms are caused by the breathing in substances known as allergens which are contained within mite's droppings. The droppings are so small that they become the airborne and then may be breathed in. There are other allergens as well as the house dust mite which can trigger the allergic reactions e.g. moulds, cats and dogs or pollen from trees and grasses (Peat et al., 1996).

House dust mites need to be controlled

Drugs can treat and control symptoms of allergic asthma, eczema and rhinitis but do not garner a cure. Although it probably won't stop the need to use thermal together, cutting the numbers of house dust mites in the home may decrease the amount of drugs required and help to control symptoms (Kuehr et al., 1994).

A step by step guide to controlling house dust mites in the home

If one has had a positive skin or blood test to house dust mites and you feel that your symptoms are caused by the house dust mite, here are the few steps to reduce house dust mites in the home. If there is any improvement. For the best results the steps should be carried out over whole house. If this is not practical, concentrate on the rooms where the person with allergy spends most of their time i.e. the bedroom or the sitting room. The primary steps mentioned are the easiest and cheapest, the later steps are more expensive. Bear in mind that although they will decrease exposure to mites, there is no guarantee that these steps will decrease symptoms. The number of steps needed to give an effect will mainly differ from person to person and it may take at least two months before the effects of carrying

out steps are observed or analyzed (Custovic et al., 2002).

Step 1.Reduce dampness in the home

House dust mites prefer the warm, damp homes. Dampness can also lead to the growth of molds which can cause allergic reactions too. These are some major ways of mainly avoiding dampness (Custovic et al., 2000):

- Open windows or vents in the kitchens and bathrooms during and the after cooking, washing and bathing. To stop dampness spreading to rest of the house, keep the door to these rooms closed (Woodcock et al.,2004)
- Avoid drying clothes indoors, especially in bedrooms and living rooms, unless using dryers
- Which are vented outdoors? If you have to dry the clothes indoors, open a window and close door to the room where the damp clothes are
- Air bedding before the remaking beds
- Open windows or the vents in bedroom
- Run central heating the few degrees lower(especially in the bedroom)

Step 2.Prevent buildup of dust

Removing the dust is important in the homes of allergy sufferers. To help prevent dust building up in home:

- Reduce the number of the items on which dust can build up, especially if they are difficult to clean e.g. keeping the ornaments in display cabinets, placing books in closed cases and putting clothes and other objects in the cupboards or drawers
- Regularly clean surfaces/objects where dust collects availing a damp cloth. (Dry cloths will not pick up all of the dust and will let a lot of it back into the air)

Pet dander minimization (Simpson et al., 2002)

Exposure to pets (such as cats, dogs, guinea pigs, horses, rabbits, mice, rats) at home or work can trigger allergic reactions in few people. Cats and dogs are the major source of allergens in the home environment. The allergens come from the sweat glands in all cats and the salivary glands in all dogs. Although the amount of the allergen released can vary between breeds, there are no hypoallergenic animals or breeds. As the allergens are stuck to the hair and the skin of pets, the allergens become airborne when the pet

sheds their hair. The allergens can remain airborne for some time. Cat allergen is especially much difficult to remove from the houses. It can remain in the house for months after the cat has been removed. Cat allergen can also be observed in places where cats have never lived. For example, it can be carried around on the clothing to schools and offices (van de Pol et al., 2012). The most effective method of the allergen avoidance for people who are allergic to pets is removal of the pets from the home. For example, if there is no skeptical thinking that cat or the other animal allergen is a major cause of symptoms then the best advice is for the animal to be removed from the home. It can be very much an emotional decision, but removing the pet should be much considered.

If pets cause only very minute problems, keeping pets out of bedrooms and living areas may be much a compromise. Even then, it may take months after pet removal before allergen levels are reduced. The effectiveness of some measures such as washing the animals frequently and using HEPA air filters remains uncertain (Custovic et al., 1994).

Dogs, guinea pigs, mice and the rabbits are not as allergenic as cats and are more

easily kept outside, but can still cause annoying and also occasionally serious problems. Horse allergy is very serious and even the animal hair on clothes may be sufficient to trigger asthma. Great care must be taken to shower and change the clothes before returning to a home of a person allergic to horses. Birds may occasionally cause much of allergic symptoms (Murray et al., 1983). This is a different problem to the pigeon fancier's lung which is a serious condition and requires a complete avoidance.

Mold minimization

Mold in the home can show as mould, mildew or musty smell. It is commonly found in bathrooms, refrigerators and in places with little air circulation such as the walk-in and built-in wardrobes, and in the bedrooms with ensuite bathrooms (Scott et al., 2012).

If one is allergic to mould, you may consider (Sears et al., 1989):

- Removing the visible mould by cleaning with bleach or other mould reduction cleaners
- Ensuring the adequate natural ventilation including the use of extractor fans

- Sealing the leaks in bathrooms and roofs
- Overview of the dust mites

THE DUST MITE TAXONOMY

Mites and the ticks are 8-legged arthropods termed arachnids that belong to the taxonomic order of Acari, which typically comprises tens of thousands of species grouped under several suborders, families, and genera. Most of these mites live freely in several biologic habitats, are very diverse in the form and behavior, and function in the biologic recycling process as scavengers or the saprophagous mites. Other mite species are plant parasites and major pests for crops, and still others can specifically transmit diseases to humans (chiggers, ticks). However, relatively few species of the mites, which belong to a particular taxon (Astigmata), have clearly been shown to generate allergens that induce IgE-mediated allergic reactions in susceptible individuals.

CONCLUSION

Dust is the main allergen which is mainly observed in indoor and outdoor sites. Type I hypersensitivity or IgE mediated allergic reactions can be triggered by dust as allergen, there are various disorders manifested with dust as allergen.

REFERENCES

- I. Chew GL, Reardon AM, Correa JC, et al. Mite sensitization among Latina women in New York, where dust-mite allergen levels are typically low. *Indoor Air*. 2009; 19:193e197 (III).
- II. S. Sreeremya, *International Journal of Molecular Biotechnology, Style (Hordeolum) – Review S. Vol. 4: Issue 1*, 2018.
- III. Rosenstreich DL, Eggleston P, Kattan M, et al. The role of cockroach allergy and exposure to cockroach allergen in causing morbidity among inner-city children with asthma. *N Engl J Med*. 1997; 336:1356e1363.
- IV. Charpin D, Birnbaum J, Haddi E, et al. Altitude and allergy to house-dust mites. A paradigm of the influence of environmental exposure on allergic sensitization. *Am Rev Respir Dis*. 1991; 143:983e986 (III).
- V. Sporik R, Squillace SP, Ingram JM, Rakes G, Honsinger RW, Platts-Mills TA. Mite, cat, and cockroach exposure, allergen

- sensitization, and asthma in children: a casee control study of three schools. *Thorax*. 1998; 54:675e680 (IIa).
- VI. Sporik R, Ingram JM, Price W, Sussman JH, Honsinger RW, Platts-Mills TA. Association of asthma with serum IgE and skin test reactivity to allergens among children living at high altitude. Tickling the dragon's breath. *Am JRespirCrit Care Med*. 1995; 151:1388e1392 (IIb).
- VII. Peters JL, Suglia SF, Platts-Mills TA, Hosen J, Gold DR, Wright RJ. Relationships among prenatal aeroallergen exposure and maternal and cord blood IgE: project ACCESS. *J Allergy ClinImmunol*. 2009; 123:1041e1046 (IIb).
- VIII. De Lovinfosse S, Charpin D, Dornelas A, Birnbaum J, Vervloet D. Can mite specific IgE be used as a surrogate for mite exposure? *Allergy*. 1994; 49:64e66 (IIa).
- IX. Peat JK, Tovey E, Toelle BG, et al. House dust mite allergens. A major risk factor for childhood asthma in Australia. *Am J RespirCrit Care Med*. 1996; 153:141e146 (IIb).
- X. Kuehr J, Frischer T, Meinert R, et al. Mite allergen exposure is a risk for the incidence of specific sensitization. *J Allergy ClinImmunol*. 1994; 94:44e52 (IIb).
- XI. Custovic A, Simpson BM, Murray CS, Lowe L, Woodcock A. The National Asthma Campaign Manchester Asthma and Allergy Study. *Pediatr Allergy Immunol*. 2002; 13(suppl 15):32e37 (IIa).
- XII. Custovic A, Simpson BM, Simpson A, et al. Manchester Asthma and Allergy Study: low-allergen environment can be achieved and maintained during pregnancy and in early life. *J Allergy ClinImmunol*. 2000; 105:252e258 (IIa).
- XIII. Woodcock A, Lowe LA, Murray CS, et al. Early life environmental control: effect on symptoms, sensitization, and lung function at age 3 years. *Am JRespir Crit Care Med*. 2004; 170:433e439 (IIb).

-
- XIV. Simpson A, Simpson B, Custovic A, Cain G, Craven M, Woodcock A. Household characteristics and mite allergen levels in Manchester, UK. *Clin Exp Allergy*. 2002; 32:1413e1419 (III).
- XV. Van de Pol MA, Lutter R, van Ree R, van der Zee JS. Increase in allergen specific IgE and ex vivo Th2 responses after a single bronchial challenge with house dust mite in allergic asthmatics. *Allergy*. 2012; 67:67e73.
- XVI. Custovic A, Taggart SC, Woodcock A. House dust mite and cat allergen in different indoor environments. *ClinExp Allergy*. 1994; 24:1164e1168 (III).
- XVII. Murray AB, Ferguson AC, Morrison BJ. Diagnosis of house dust mite allergy in asthmatic children: what constitutes a positive history? *J Allergy ClinImmunol*. 1983; 71:21e28 (III).
- XVIII. Scott M, Roberts G, Kurukulaaratchy RJ, Matthews S, Nove A, Arshad SH. Multifaceted allergen avoidance during infancy reduces asthma during childhood with the effect persisting until age 18 years. *Thorax*. 2012; 67:1046e1051.
- XIX. Sears MR, Herbison GP, Holdaway MD, Hewitt CJ, Flannery EM, Silva PA.
- XX. The relative risks of sensitivity to grass pollen, house dust mite and cat dander in the development of childhood asthma. *Clin Exp Allergy*. 1989; 19:419e424 (III).
-