Dust mites allergy: Modern evaluation

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INTRODUCTION

Dust mite allergy is an allergic response to dust mite allergens that are often found in home dust. It is sometimes referred to as home dust allergies. It is a hypersensitivity and allergic reaction to dust mite droppings. The droppings are an indoor aeroallergen that causes an allergic response when inhaled. The prevalence of atopic illnesses such as allergic rhinitis and asthma, with home dust mites as the allergen, is on the rise. Around 1920, house dust allergy was discovered as an allergen. Dermatophagoides Pteronyssinus (DP) was discovered as the causal allergen causing home dust allergies in 1967. In 1980, the cysteine protease Dermatophagoides pteronyssinus allergen I or DP 1 was discovered, followed by DP 2 and related Dermatophagoides farinae 1 and Dermatophagoides farinae 2. The House Dust Mite (HDM or DM) is the most common source of indoor allergies. Allergic rhino-conjunctivitis, allergic asthma, and atopic eczema are some of the allergic disorders linked to HDM. The best treatment strategy for allergic rhinitis is to avoid allergens initially, followed by medication and Allergen Immunotherapy (AIT). Antihistamines, leukotriene receptor antagonists, and inhaled or Intranasal Corticosteroids (ICS) are the right medication. All of these therapies are effective and safe, but they have not been shown to affect the course of HDM-related allergy disorders.

EVALUATION

The physician is prompted to perform tests for the diagnosis of dust mite allergy based on the patient's current symptoms, prior medical history of allergic manifestations, home environment, and circumstances.

In vivo **techniques**

- Prick test on the skin. It has a high sensitivity and is used as the first-line test for detecting dust mite allergy sensitization. It is a quick, low-cost test that produces results in 20 minutes. However, due to cross-reactivity, it may yield a large number of false-positive findings. It is not recommended for those who have dermatitis or are taking antihistamines
- Patch testing for Atopic Dermatitis It identifies the T cell-mediated allergic response
- Test for basophil activation. It is a quantitative test that identifies activation indicators on the surface of basophils in whole blood. Patients who are already taking antihistamines can have this test done. It also exhibits a functional reaction. Inconsistent findings may be found, however, due to the many commercial testing kits and methods utilised
- Provocation test for the nose. It determines and quantifies the clinical significance of dust mite allergens. The respiratory mucosa is exposed to the dust mite allergen, and the clinical responses that result are observed. The variations in nasal airflow and patency are then graphically shown using anterior rhinomanometry and sonic rhinometry
- Blood test for IgE antibodies

In vitro **techniques**

- The Enzyme-Linked Immunosorbent Assay (ELISA) is a kind of immunoassay that uses enzymes to (ELISA). It is capable of detecting both total and specific IgE levels. Competitive ELISA can be used to account for IgE cross-reactivity. The drawback is that ELISA cannot be utilised to conduct a comprehensive study of numerous allergens
- Test for Radioallergen Sorbent (RAST). It is an in vitro test used to detect IgE levels. The patient's blood IgE bound to the allergen is immobilised on a solid substrate and then identified using radiolabeled anti-IgE antibodies. Because better methods, like as ELISA, are now available, their usage has been limited
- Microarrays. It is capable of detecting numerous antigens on a single slide. It offers both single-plex (ImmunoCAP) and multiplex (ImmunoCAP ISAC) tests. ImmunoCAP immunosorbent allergen chip is a commercially available microarray that is used to determine an individual's full allergy sensitivity profile. A MeDALL chip, which may be used to monitor IgE and IgG, is a better available microarray
- Fluoroenzyme immunoassays
- Asthma diagnosis. Dust mite allergies can develop to asthma or an asthma exacerbation over time.
- Maximum expiratory flow rate PEFR. PEFR is greater than or equal to 200 L per minute in mild asthma, 80 L to 200 L per minute in moderate asthma, and less than 80 L per minute in severe asthma.
- Spirometry. When there is no acute asthma, the methacholine challenge test is utilised. A decrease in FEV1 of less than 20% following administration of methacholine is diagnostic for asthma. Inhaled beta-agonists, such as salbutamol, can be used to treat acute asthma. Asthma is diagnosed when FEV1 rises by 12% or higher
- Asthmatics sensitive to home dust mites have a lower FEV1/FVC ratio than asthmatics who are not sensitised

Immunochemical tests, such as the RAST inhibition method, sandwich radio or enzyme immunoassays, or MAb assays, can be used to quantify dust mite allergens in the home. However, its application is restricted due to the need for experienced laboratory personnel and complex equipment.

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