

Allergic airway disease: is asthma inevitable?

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Exposure and sensitization to inhalant allergens, particularly house-dust mites, are significant risk factors for asthma. There is evidence that exposure to other indoor allergens, such as cat, dog, and cockroach, is likewise of importance. The prevalence of IgE-mediated sensitization to mite and cat in the first years of life correlates with the environmental allergen concentration. The severity of asthma is also related to allergen exposure. Although there is clearly a genetic factor underlying the development of sensitization and airway hyperresponsiveness, allergen exposure is established as the best-defined and probably most important determinant for the development of allergy and asthma.

Therefore, effective allergen avoidance is of critical importance in primary, secondary, and tertiary prevention. Avoidance measures in the domestic environment should be introduced at the earliest possible stage. Recent investigations of the influence of allergen exposure (mite, cat) on allergic sensitization in infancy and early childhood have clearly shown that

- 1) there is a dose relationship between exposure and the risk of sensitization without a no-risk level
- 2) an exposure-risk association is already present during the first year of life.

This is the time for the study of intervention strategies aimed at primary prevention. Allergen-elimination measures must probably use different approaches developed to suit the particular allergen. Avoidance of mite allergen should be directed against the allergen reservoirs, such as mattresses and carpets. Elimination of cat allergen may be more difficult due to the high proportion of airborne particles. Therefore, air filtration may be necessary. Not only private homes, but also official buildings have probably to be included in attempts to reduce cat exposure.

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Secondary prevention (i.e., prevention of asthma development in sensitized subjects) should likewise include allergen avoidance. Measures should include all possible strategies, directed against all allergens that have induced sensitization. In addition to mite or cat, pollen, moulds, and occupational allergens may also be of importance, although the efficacy of the avoidance of these allergens is less well documented. When avoidance is not feasible, specific immunotherapy should be considered. We now have initial data showing that the progression of allergic disease from rhinitis to asthma may be prevented by specific immunotherapy, as may the development of new sensitizations.

To date, avoidance studies have focused only on tertiary prevention; i.e., reduction of clinical symptoms and bronchial hyperresponsiveness, or medication. A number of studies have clearly demonstrated clinical efficacy in mite

allergy, encasings for mattresses being the most effective measure. Climatic factors may also be included in avoidance strategies, particularly sojourns at high altitude, as suggested by studies in children who thereby lost their bronchial hyperresponsiveness and had reduced specific and total IgE concentrations after several months.

Recent advances in pharmacotherapy could contribute to asthma prevention; e.g., by antibodies directed against IL-4, IL-5, IL-13, or other regulatory cytokines. Similarly, new ways of immunotherapy, as by IgE antibodies or modified allergens, could also add to asthma prevention strategies.

The "asthma epidemic" requires intensified efforts to reduce the causative factors and/or the pathologic responses of the organism. Both principles are now under investigation. However, it is too early to predict which measures will be most effective and whether a reduction of asthma prevalence is an achievable goal.

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