



Sensitization to Pet Allergens

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Summary: Over the past decades there has been an increase in the incidence of allergic diseases. The spectrum of sensitization is wide enough, individual and specific for each region.

In our region sensitization to epidermal allergens of domestic animals is legitimately considered as one of the key risk factors in the development of allergic rhinitis and bronchial asthma, and also largely determines the formation of severe forms of atopic dermatitis and respiratory allergies. Of particular importance is the fact that, unlike other triggers, the elimination of pet allergens is often associated with internal resistance on the part of patients.

Key words: patients, allergic diseases, cat allergens, pets, scarification skin tests.

In our region sensitization to pet epidermal allergens is absolutely rightfully considered one of the key risk factors in the development of allergic rhinitis and bronchial asthma, and also largely determines the formation of severe forms of atopic dermatitis and respiratory allergies. At the same time, unlike other reasons causing allergy symptoms, in case of hypersensitivity to pet allergens the elimination of pets is often connected with the internal resistance of patients and their relatives, who consider pets to be valuable members of the family. Certainly, various aspects of the considered problem are connected with a great number of baseless statements leading to inadequate prevention and therapy, as well as negatively affecting social activity of patients and their families. The factors determining the formation of IgE-mediated sensitization and further development of clinical manifestations of allergy to inhaled domestic animals allergens can be divided into three groups: subject characteristics, features of allergen exposure, and additional effects.

The characteristics of the subject include genetic predisposition, the age of the patient at the first and subsequent contacts with the allergen, the presence of other allergic and non-allergic diseases, etc. The effect of exposure to animal allergens is related to the biological activity of the allergen; the duration, mode and intensity of exposure. For example, cat owners have a significantly increased risk of sensitization to cat epidermal allergens. The exposure to other allergens could be included to the

additional factors, including mammals, microorganisms, endotoxins, etc. The probability of sensitization formation is higher in the case of high concentrations of animal allergens. Levels of cat and dog allergens are approximately 50-200 times higher in dwellings with pets than in those without pets.

According to the research conducted at the Republican Scientific-Specialized Allergology Center – allergic scarification skin tests with cat allergen out of 100 people, 63 revealed sensitization to cat allergen. Of the 63 patients, 32 did not have a pet. According to the results of this survey in the Republic of Uzbekistan, about 29% of residents living in the country keep various domestic animals in the home (cat, dog, cow, sheep, horse, etc.). It should be noted that in recent years, along with universally recognized pets, other mammals such as rabbits, guinea pigs, mice, hamsters, etc. are becoming increasingly popular. It is estimated that 5% of dwellings in the United States and Europe have a small animal. However, the concentration of allergens from these animals in the home is not yet known. At the same time, it has been proven that the presence of sIgE to the allergens of traditional pets (cat, dog) dramatically increases the likelihood of developing sensitization to the allergens of other mammals. About 50% of individuals sensitized to allergens of the most common pets (cats/dogs) are directly exposed to these animals in the home.

While approximately 50% of those sensitized to cat and dog allergens do not own these animals. Among cat owners, 20% have positive prick tests with a cat allergen extract.

Thus, it is possible, with certain assumptions, to speak of a higher potential for cat allergens compared to dog allergens. Among children with bronchial asthma, sensitization to cat allergens was detected in 41% of patients and to dog allergens in 21%. Sensitization to cat and dog allergens can also occur in healthy subjects. Sensitization to cat and dog allergens can also occur in healthy subjects. For example, a German study that included more than 7,000 healthy adults found that sIgE to both cat and dog allergens were detected in 7%. The prevalence of sensitization to animal allergens increases during childhood. In a population-based cohort (BAMSE study), the frequency of detection of sensitization to animal allergens increased from 5.7% at ages 3-6 years to 17.2% at ages 14-17 years.

Sensitization to cat allergen increased from 6.4% to 19.0%; to dog allergen from 4.8% to 22.6%; and to horse allergen from 3.1% to 10.6%. From the point of view of developing primary prevention of inhalation allergy, studies of the relationship between exposure to allergens and the development of sensitization or tolerance are of particular interest. For example, sensitization to cat allergens can develop in subjects living in homes without pets if there are enough homes with cats in the area. If animals are found in relatively few homes in the area (diseases under conditions of exposure to appropriate allergens; develop indications for prevention and optimal therapy, including allergen-specific therapy. Inhaled mammalian allergens are found in serum, dander, wool, saliva, urine, and feces. Moreover, the allergenic composition varies depending on the origin of the allergen (e.g., epithelium or saliva).

The most common pet that causes allergies is a cat. The biological function of this major allergen remains unknown. Cross-reactivity to several allergen sources: cat, dog, and horse is probably partially associated with this allergen. Of particular interest is the effect of changing allergen exposure on the prognosis of the further course of the disease. The sIgE level decreases after removal of the pet, but this decrease is not significantly associated with clinical manifestations. It has been described that in some patients the intensity of the clinical response decreases under conditions of constant high exposure to the relevant allergen. The most radical and absolutely generally accepted measure in the treatment of patients sensitized to inhaled pet allergens is to remove the pet from the home. However, this is not always possible and, in addition, allergens are present in the room for a long time even after the removal of the pet. Consequently, various interventions to reduce the concentration of pet allergens have been implemented, which to date have no proven clinical efficacy. Understanding the

multidimensionality of sensitization to inhaled mammalian allergens allows critical consideration of the possibility of the existence of hypoallergenic animals ("hypoallergenic cat", "hypoallergenic dog"). It should be emphasized that the possibility of creating hypoallergenic breeds is a commercially oriented project, which has nothing to do with the real problems of patients.

The creation of "hypoallergenic pets", despite the presence of quite active marketing conducted by a number of companies, has no scientific justification. Allergen-specific immunotherapy with allergens of domestic animals is intensively being developed and already used in a number of countries, but unfortunately therapeutic allergens (dog, cat) have not yet been registered in our country. Thus, the analysis of sensitization profile to inhaled allergens of domestic animals in combination with clinical data and assessment of patient contacts with relevant animal allergens may fundamentally optimize prevention and therapy of allergic diseases.

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