



## FEATURES OF THE SENSITIZATION SPECTRUM OF ATOPIC ASTHMA AND RHINITIS

**Ikramova Shakhnoza Abdurasulovna**

Doctoral student at the Department of Propaedeutics of Internal Diseases, Bukhara State Medical Institute

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### Abstract:

The pathogenetic characteristic of atopic bronchial asthma (BA) is chronic allergic inflammation of the airways, initiated by contact with causally significant allergens. Identification of sensitization is a necessary condition for successful therapy of asthma, and the structure of sensitization may have regional characteristics.

**Keywords:** children, bronchial asthma, treatment, aeroallergens, method, skin tests.

### INTRODUCTION

Asthma is the most common chronic respiratory disease in children. Despite the variety of clinical manifestations, an invariable feature of the pathogenesis of asthma is chronic allergic inflammation of the respiratory tract, in the occurrence and progression of which contact with causative allergens is of exceptional importance [1–4]. In this regard, accurate identification of causally significant allergens in a particular patient is a necessary condition for the treatment of asthma and other allergic diseases. This, firstly, is associated with the task of creating a hypoallergenic environment, which is important both for preventing the formation of asthma and for minimizing the risk of exacerbations and progression of the disease. Secondly, verification of the spectrum of sensitization in patients with atopic asthma is necessary to determine the possibility of conducting allergen-specific immunotherapy (ASIT), an effective method of treating allergic diseases that affects the pathogenetic mechanisms underlying atopic asthma. Currently, ASIT is considered as an important component of complex treatment of asthma, which also includes environmental control and pharmacotherapy [2].

### MATERIALS AND METHODS

A retrospective study of the results of skin tests in patients with asthma was performed based on an analysis of medical records. A total of 98 case histories of patients with atopic asthma aged from 3 to 17 years (average age  $9.1 \pm 4.6$ ), of which 69 boys and 29 girls, received treatment and examination, were analyzed. BA verification was carried out in accordance with existing domestic and international agreement documents. All children had a symptom complex characteristic of bronchial asthma. At the time of the examination, the children had no symptoms of exacerbation of the disease and did not receive antihistamines. The main criteria for exclusion from the study were the presence of fever and/or symptoms

of a bacterial infection in the upper respiratory tract, including the presence of mucopurulent secretion in the nasal cavity.

### RESULTS AND DISCUSSION

Sensitization to household allergens (house dust, library dust, house dust mite allergens) was detected in 71% (70/98) of patients, to epidermal allergens (cat hair, dog hair, horse dander, pillow feathers) - in 38% (37/98) patients, to pollen allergens (trees, cereals, weeds) in 72% (71/98) of the child (figure). The proportion of patients who had household sensitization and patients who had pollen sensitization was statistically significantly higher than the proportion of patients who had epidermal sensitization  $Z=31.98$ ;  $p=0.01$ , respectively. At the same time, the proportions of patients who had household sensitization and those who had pollen sensitization were comparable.

A combination of household (1), epidermal (2) and pollen (3) sensitization was detected in 24% (24/98) of children, a combination of sensitization to two groups of allergens in 35% (34/98) of patients, sensitization to one of the groups of allergens in 41% (40/98) of patients. Thus, in 59% (58/98) of patients with asthma, sensitization was of a combined nature.

Positive skin tests to household allergens were observed in 71% (70/98) of the examined patients, of which 56% (55/98) of children had positive reactions with house dust allergens (HDA). Moreover, in 78% (43/55) of patients the reaction was assessed as weakly positive, in 15% (8/55) of patients as positive, in 3.6% (2/55) of patients as strongly positive, and in 3.6% (2/55) skin test results were considered hyperthermic. The proportion of patients with a sharply positive and hyperergic reaction was 4% (4/98) of the number of patients examined. Thus, sensitization in general to ADP is typical for children with asthma, but there is a predominance of weakly positive reactions during skin testing of these children.



When performing skin tests with library dust (LD) allergens, a positive reaction was detected in 24% (24/98) of patients. Of these, in 71% (17/24) they were regarded as weakly positive, in 29% (7/24) of patients - as positive reactions.

Positive reactions with house dust mite allergens occurred in 42% (41/98) of patients, of which in 90% (37/41) children the reactions were assessed as weakly positive, in 7% (3/41) as positive resident and in 2% (1/41) of patients as sharply positive.

When analyzing the results of skin tests with epidermal allergens (pillow feather, horse dander, cat hair and dog hair), sensitization to one or more of the listed allergens was detected in 38% (37/98) of patients with atopic BA. Moreover, 46% (17/37) of these patients had positive skin tests with one, 38% (14/37) of patients with two, 13% (5/37) of patients with three, and 3% (1/37) patients with all four specified epidermal allergens.

The most common condition was sensitization to cat hair allergens, which was detected in 30% (29/98) of patients. Of these, in 83% (24/29) children the reactions were assessed as weakly positive, in 10% (3/29) patients as positive, in 6% (2/29) patients as strongly positive and/or hyperergic.

Skin tests with pillow feather allergens revealed sensitization to these allergens in 15% (15/98) of patients, in 73% (11/15) of them the reaction was assessed as weakly positive, in 26% (4/15) patients as positive and/or hyperergic.

Sensitization to horse dander antigens was detected in 16% (16/98) of patients, in 50% (8/16) of them the reaction was assessed as weakly positive, in 38% (6/16) of patients as positive and in 12% (2/16) – as hyperergic.

When performing skin tests with dog hair allergens, positive reactions occurred in 6 out of 98 patients examined, of which weakly positive reactions were detected in 83% (5/6) of patients, positive reactions – in 17% (1/6) of patients.

The prevalence and severity of sensitization to allergens of cat hair, horse dander, and feather pillows were comparable. The proportion of patients with sensitization to dog hair and the severity of this sensitization were significantly lower than for other epidermal allergens.

Considering that the epidermal allergens listed above are a set of household allergens, complementing the spectrum of household allergens, it becomes obvious that the cumulative consideration of sensitization to household and epidermal allergens contributes to a more complete understanding of the impact of the housing ecology on the body of a patient with asthma.

Allergies to household or epidermal allergens or a combination thereof were detected in 74% (73/98) of those examined. Moreover, a combination of household and epidermal allergies occurred in 35% (34/98) of children. The high prevalence of household and epidermal sensitization among patients with atopic asthma indicates the need for a careful approach to the development and implementation of measures to improve the ecology of housing in order to reduce the trigger load in patients with asthma.

### **CONCLUSION**

This indicates a potentially wide range of triggers that can both provoke an exacerbation of the atopic process and maintain allergic inflammation in the shock organ. The results of the study confirm, on the one hand, the need to improve work on creating a hypoallergenic environment in those rooms where children are often present. These measures are relevant not only for residential premises, but also for kindergartens and schools, since the prevalence of bronchial asthma in the child population is quite high. On the other hand, the data obtained indicate the potential feasibility of widespread use of ASIT in the treatment of patients with atopic asthma, taking into account the sensitization identified in these patients.

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