

STUDY ON THE INVOLVEMENT OF *AMBROSIA ARTEMISIFOLIA* POLLEN IN CAUSING ALLERGIC RHINITIS IN ARAD COUNTY

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ABSTRACT. Background. Allergic rhinitis is an important prevalent allergic disease in our country, but there are no many epidemiological studies regarding the sensitization to different aeroallergens. **Methods.** In a retrospective study performed on 258 patients with rhinitis, skin prick tests were performed using the panel of standardized aeroallergens. **Results.** In our study 69.37% of patients presented allergic rhinitis. Mites and the pollens are the most relevant aeroallergens in the study (26.81% *Dermatophagoides pteronyssinus*, 22.34% *Dermatophagoides farinae*, 50.83% pollens). Sensitization for the pollens is: grass (43.25%), tree (21.35%) and weed (35.40%). **Conclusion.** This study characterizes the aeroallergen sensitization and shows that house dust mites and grass pollens are the most frequent involved in the allergic rhinitis etiology. In July and August when the pollen of ambrosia is high in the atmosphere involvement in the etiology of allergic rhinitis can reach up to 73.85%.

Keywords: aeroallergens, rhinitis, ambrosia, mites, pollens, fungi

INTRODUCTION

Allergic rhinitis is defined as a symptomatic “disorder” appeared to the nose and induced by exposure to allergens; its intimate mechanism is the IgE-mediated inflammation in the nasal mucosa (Hjern A., 2006). This condition is clinically manifested by symptoms such as sneezing, runny nose, nasal obstruction and altered olfaction.

Allergic rhinitis is a global public health problem affecting 10-20% of the population, the prevalence of this disease is growing (Hjern A., 2006, Bouayad Z. et al., 2006, Popescu F.D., 2003). In our country allergic rhinitis meets prevalence but no statistics on the role of different allergens in the development of the disease in the country or at our geographical area (Bousquet J. et al. 2003).

Allergens sources are many. IgE mediated allergens allergy shows an unlimited variety. Depending on the route of access to the immune system, allergens are classified as inhaled, ingestion, contact allergens and injection allergens.

Inhale allergens or airborne (pollens, mites, molds, dangerous, animal scales, plant fragments) is the most common cause of allergic sensitization.

Pollen grains are handled differently in the case of entomophilous and anemophilous plants. Anemophilous plants are a major source of pollen, small grains are carried by wind from distant source. These plants have colorful flowers. From their group are weeds, perennial plants that grow wild. Weeds have no agriculture and decorative importance but represent an important cause of allergic sensitization.

Although initially considered the main factor of allergies in America, today Ambrosia pollen is a major source of allergies in Europe. In Romania, areas where weeds have been identified - ambrosia in large quantities - are the Mures Valley, the Banat, Bihor

county. In Europe, large *Ambrosia* spreading meets the Rhone Valley in particular, in some states in the Balkans in the Krasnodar district. Hungary ranked fourth in some statistics on the frequency spread (Heinzerling L. et al., 2005).

Pollens are released early in the morning. In the afternoon hours pollen concentration reached maximum levels decreases with falling in early evening. Plant flowering period coincides with the maximum concentration of pollen in the atmosphere-pollinosis and allergic symptoms (allergic rhinitis, allergic conjunctivitis, asthma, contact urticarial lesions).

Initial studies conducted in Ambrosia pollen have identified a variety of antigens of which five pollen allergens were found: two major fractions called E and K and three minor fractions called RA3, RA4, RA5 (Bouayad Z. et al., 2006).

Ambrosia pollen shows cross reaction with other weed pollen grains and vegetables and certain, the association between pollinosis from Ambrosia and hypersensitivity reactions *Cucurbitaceae* (watermelon, yellow squash, cantaloupe, cucumber) and banana have been described. In this case it oral allergy syndrome and severe reactions in some cases anaphylactic shock type. In general, little derivatives pollens calendar, periods of prosperity are: late summer and autumn grasses and weeds, late spring to midsummer (end of July) for *Gramineae* and late winter (February) and early spring (March, April) for trees and trees.

Ambrosia artemisiifolia species is native to North America is part of the plant routinely called “bad plants” was discovered and identified as a weed in the U.S. in 1838 after the writings of Wagner and Beals 1958. Amazing was the fact that Canada has found pollen belonging to this species, with more than 60,000 years old, since its pollen to interglacial period.

Intensifying trade between Member North American continent and the world, dependent transport of potatoes, grain and clover seed has made this species to spread into new areas. For the first time, this is signaled *Ambrosii* on the European continent in 1863 in Germany and Switzerland in 1870 and then. Because of its poor acclimatization and competitiveness, this plant has not extended too much time in the spontaneous flora and remained unknown.



Fig. I *Ambrosia artemisiifolia*

It was brought illegally from North America, arrived in France has become a controversial topic as it seems it was introduced in 1863, with a lot of red clover seeds. Incidental contamination is due to U.S. planes carrying grain during the Second World War. Since the '50s, quickly spread throughout Europe, Lyon has been reported in all regions in 1950 and between 1960-1970 has raised health concerns among area residents. Now, more than 100,000 people in the region of Rhone-Alpes are affected by allergies. In France, it is mostly prevalent in the eastern region of the country. In Hungary, it seems that a fairly large area is reached, because of local facilities, which have made possible the conquest of a very large area. Of *Ambrosia* species known, only two have a special importance in allergology: *Artemisiifolia* and *Trifid* (which is less abundant). Bloom from August to October, released into the air millions of pollen grains that are carried by wind from distant source. This indicates pollen in honey and a small source of pollination by insects.

Apart from environmental sources (sandy soil, swamps, roadsides) unexpected exposure to *Ambrosia* pollen is the case for the use of herbal remedies or homeopathic preparation which were used leaves of these weeds. The two species are the main cause of allergies in Europe and North America. Sensitized patients, the pollen of these herbs can cause symptoms of allergic rhinitis, allergic conjunctivitis, asthma and rarely, rashes and anaphylaxis.

MATERIALS AND METHODS

The aim of our study was to determine the proportion of all cases of allergic rhinitis hay; type aeroallergens involved in IgE mediated hypersensitivity in allergic rhinitis aeroallergens often they are involved in the etiopathogenesis of this disease. Thus, a group of 258 patients from both urban and rural aged 18-70 years who were ambulatory allergy presented in January 2008 - December 2010 and which was diagnosed rhinitis allergy was performed by skin prick test to emphasize standardized IgE mediated hypersensitivity aeroallergens. We used prick allergy test kit approved for use in Romania by the Ministry of Health and the National Medicines Agency.

Skin prick allergy testing was done by your allergist, and patients were followed at least 30 minutes post-test. Allergenic extracts used were:

- house dust mites: *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*;
- Pollens of trees / shrubs early I mixture that contain extracts of pollen from plants of the family *Betulaceae*: Birch (*Betula verrucosa*), alder (*Alnus glutinosa*), hazel (*Corylus avellana*);
- Early mixed tree pollens II, pollen-containing extracts of willow (*Salix caprea*) and aspen (*Populus deltoides*) *Salicaceae* family - and ash (*Fraxinus excelsior*);
- pollens of grasses (family *Poaceae*) mixture, which contains extracts The pollen of wild grasses (*Poa pratensis*, *Phleum pratense*, *Festuca rubra*, *Dactylis glomerata*, *Holcus lanatus*, *Lolium perenne*, *Agrostis stolonifera*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*) and cultivated grasses (*Secale cereal*) ;
- pollens from grasses or weeds mixture that contains extracts of *Artemisia vulgaris* pollen, *Rumex acetosella*, *Plantago lanceolata*, *Urtica dioica*, and two individual allergenic extract (*Ambrosia* and *Artemisia vulgaris artemisiifolia*).



Fig. II Prick allergy test kit

RESULTS

Of the 258 patients with clinical diagnosis and ENT allergy rhinitis, 179 had allergic rhinitis (69.37%)

proved by allergy skin prick test with standardized allergen extracts, and 79 had non-allergic rhinitis

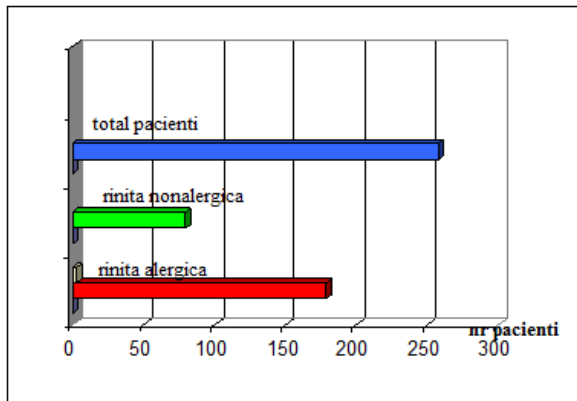


Fig.1 Allergic rhinitis prevalence

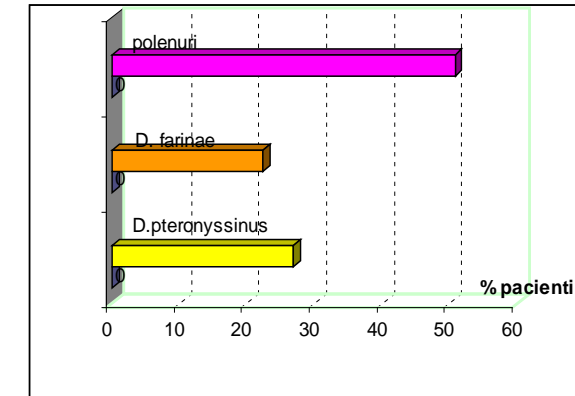


Fig. 2 Etiopathology of allergic rhinitis

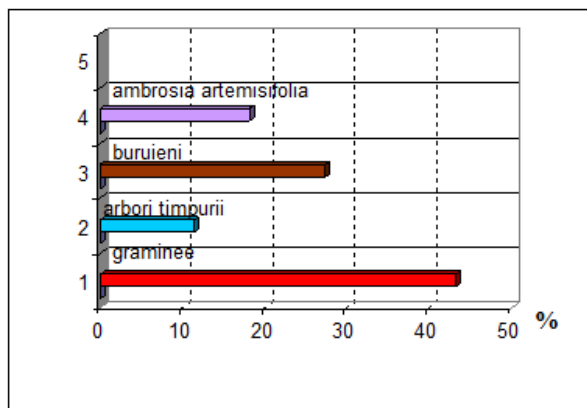


Fig. 3 The types of pollen involved in causing allergic rhinitis

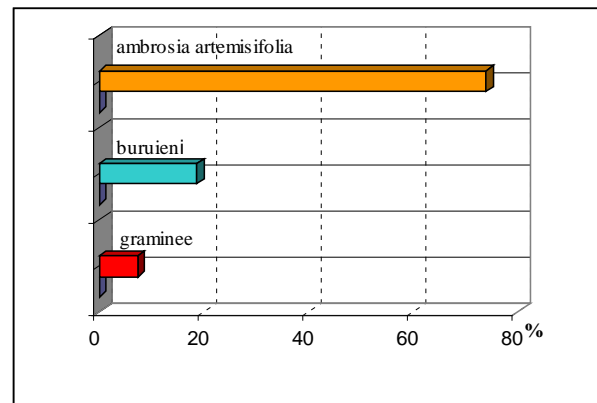


Fig. 4 *Ambrosia artemisifolia* pollen incidence in the period from July to August

Evaluation of different categories of involvement aeroallergen IgE mediated hypersensitivity in allergic rhinitis found that most patients with allergic rhinitis are sensitized to dust mites and pollens (Fig. 2). The most common aeroallergen involved in etiopathogenesis of allergic rhinitis were: *Dermatophagoides pteronyssinus*, 48 cases (26.81%), *Dermatophagoides farinae*, 40 cases (22.34%) and pollens, 91 cases (50.83%).

Patients allergic to *Dermatophagoides pteronyssinus* and in most cases showed IgE-mediated sensitization to *Dermatophagoides farinae*. Patients sensitized to pollen type were often sensitized to other pollens.

Among the pollens, the most frequently involved in IgE-mediated sensitization of allergic rhinitis were grass pollens (43.25%), followed by pollens of trees early (21.35%) and pollens from grasses or weeds (35.40%).

Skin testing performed in July and August indicate allergic sensitization to pollen Ambrose up to 73.85% of all cases of allergic rhinitis.

The results are consistent with those from literature according to which 50% of patients with allergic rhinitis have actually rhinitis (Hjern A., 2006). Aeroallergens most commonly incriminated in IgE mediated hypersensitivity in allergic rhinitis are dust mites and pollens study conducted in accordance with other recent studies (Popescu F.D. and Vieru M., 2001). Besides raising the dominant grass pollens, we found a sensitization to pollen of *Ambrosia* and *Artemisia vulgaris* pollens that during July-August is the dominant allergen in allergic rhinitis.

Also, data from literature shows that in countries where increases Ambrose, its pollen is one of the major factors is the cause of allergic rhinitis and severe asthma exacerbations seen in late summer, described in the form of real epidemic of asthma. Most accuse are produced by breeding plants whose reproduction process takes place by the wind, and seasonal occurrence of these accusations. A small number of 15-20 pollen particles per cubic meter of air are able to induce an allergic reaction.

CONCLUSIONS

Allergic rhinitis with IgE mediated hypersensitivity aero allergens has a significant prevalence. Aeroallergens most commonly incriminated in IgE mediated hypersensitivity in allergic rhinitis are dust mites and pollens, which follows in descending order of frequency of animal epithelia and molds. The house dust mites, *Dermatophagoides pteronyssinus* and *Dermatophagoides farinae* were incriminated in approximately equal proportion. The pollens most frequently incriminated in producing aero allergens symptoms of allergic rhinitis is grass pollen, the pollen season in our country in May-July and September July Ambrosia pollen allergen is overwhelming involvement in the etiology of allergic rhinitis.

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