

CHARACTERISTICS OF SENSITIZATION AMONG ADULTS WITH ALLERGIC RHINITIS

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Abstract

Introduction. Allergic rhinitis is the most common allergic disease with increasing prevalence worldwide. Identification of sensitization is of great importance for the management of the disease.

The aim of this study was to characterize the sensitization of adults with newly diagnosed allergic rhinitis.

Materials and methods. In this cross – sectional study 203 adults [mean age 30 (range 18 – 65), 103 (50.74%) men] with newly diagnosed allergic rhinitis were included. Type of sensitization was established by skin-prick test. Number of sensitizations was assessed. The mean age and the duration of symptoms at the time of diagnosis were determined.

Results. The most prevalent sensitization among adults were house dust mites and grass pollen. Polysensitization was established in 89(43.84%) patients at the time of diagnosis. The mean number of sensitizations per patient was 1.79. No significant difference in the age of polysensitized [30.88 years, (SD 9.75)] and monosensitized [30.01 years, (SD 8.85)] was established ($p>0.05$). The duration of symptoms was significantly higher in polysensitized [7.19 (SD 5.61)] than in monosensitized [5.12, SD (4.61)] patients ($p<0.001$).

Conclusions. Our study demonstrated a high prevalence of house dust mites and grass pollen sensitization in adults with allergic rhinitis. Polysensitization was a frequent phenomenon, which depended on duration of symptoms. Earlier diagnosis and management could prevent future sensitizations.

Key words: allergic rhinitis, adults, sensitization, monosensitized, polysensitized.

Introduction.

Allergic rhinitis (AR) affects more than 30% of the population worldwide. It represents an inflammatory disorder of the nasal mucosa initiated by an allergic immune response to inhaled allergens in sensitized individuals [15].

The main symptoms of AR are nasal congestion, rhinorrhoea, itchy nose and/ or eyes, sneezing. The presence of 2 or more nasal symptoms for more than 1 h per day with confirmation of nasal inflammation by clinical examination and diagnostic tests showing sensitization to inhalant allergens is the cornerstone of the diagnosis [3].

Sensitization to inhalant allergens is the main risk factor for allergic rhinitis and allergic conjunctivitis. Bousquet et al. found a global rate of sensitization to inhalant allergens 68.2% [2]. To identify clinically relevant sensitization is of great importance for the management of the disease. It can facilitate implementation of adequate environmental control, as well as allergen specific immunotherapy.

The aim of this study was to characterize the sensitization of adults with newly diagnosed allergic rhinitis.

Patients and methods.

In this cross – sectional study 203 adults [mean age 30 (range 18 – 65), 103 (50.74%) men] with newly diagnosed allergic rhinitis were included. The study was conducted in the Allergy Union of University Hospital "Sv. Georgi" - Plovdiv, Bulgaria. The patients were referred either by their general practitioners or themselves and a routine checkup was followed.

Diagnosis of AR

The diagnosis of allergic rhinitis was based on detailed medical history, physical examination, and the presence of clinically relevant sensitization established by skin-prick test. The test was performed and evaluated according to the European Academy of Allergy and Clinical Immunology (EAACI) guideline [1, 11]. Fourteen aeroallergens were tested: *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, cat dander, dog dander, cockroach, *Alternaria*, *Penicillium mix*, *Aspergillus mix*, *Cladosporium*, 5 grasses (*Doctylis glomerata*, *Lolium perenne*, *Phleum pretense*, *Anthoxanthum odoratum*, *Poa protensis*), 4 cereals (*Avena sativa*, *Triticum vulgare*, *Zea mays*, *Hordeum vulgare*), *Fagaceae*; *Betulaceae*, *Salicaceae* and *Ambrosia elatior*, using commercial allergen extracts Alyostal Prick 100IR - IC/ml (Stallergens, France). Patients were tested on the volar surface of the forearm with the distance between tests at least 2 cm to avoid cross-contamination. 1 mm prick lancets (Stallerpoint®) were used. Histamine hydrochloride 10mg/ml was used as a positive control and glycerol buffer diluents of the allergen preparations, used as a negative control. A skin prick test was considered positive when the wheal diameter was 3 mm larger than that produced by the negative control after 15 minutes. Number of sensitizations was assessed. The mean age and the duration of symptoms at the time of diagnosis were determined.

Statistical analysis

Statistical analysis was conducted using IBM SPSS Statistics 20 software (Chicago, IL, USA). Data was expressed as mean with standard deviation (SD). Fisher’s exact test was used for the comparison of the mean age and the duration of symptoms in mono - and polysensitized children with allergic rhinitis (*P*-value < 0.05 was regarded as statistically significant).

Results

A total number of 203 patients [103 (50.74%) males] were evaluated. The patients’ demographics and clinical characteristics are reported in table 1.

Patients - demographic data and clinical characteristics.		Table 1.
Gender:		
Male		103
Female		100
Age (in years)		
Mean male (SD)		29.92 (9.06)
female (SD)		30.65 (9.33)
Age range		18 – 63
Concomitant asthma		62 (30.54%)
Type of rhinitis		
Intermittent mild		4 (1.97%)
Intermittent moderate/severe		27 (13.3%)

Persistent mild	18 (8.87%)
Persistent moderate/severe	154 (75.86%)

The most frequent causes of sensitization were grass pollen and house dust mites (HDM) / (table 2).

Distribution of sensitization.		Table 2.
Type of sensitization	N (%)	
HDM	73 (35.96)	
5Grass/4cereals	127 (62.56)	
Dog dander	4 (1.97)	
Cat dander	13 (6.4)	
Bl. Orientallis	7 (3.45)	
<i>Fagaceae</i>	31 (15.27)	
<i>Betulaceae</i>	33 (16.26)	
<i>Salicaceae</i>	15 (7.39)	
<i>Alternaria</i>	31 (15.27)	
<i>Aspergillus mix</i>	11 (5.42)	
<i>Penicillium mix</i>	13 (6.4)	
<i>Cladosporium,</i>	4 (1.96)	
<i>Ambrosia</i>	2 (0.49)	

Monosensitization was established in 114 (56.16%) patients .and the rest of them (43.84%) were polysensitized (table 3). The most frequent sensitization among monosensitized patients is grass pollen (table 4).

Number of sensitizations in polysensitized patients.		Table 3
number of sensitizations:	N (%)	
Two	52 (58.43)	
Three	19 (21.35)	
Four	12 (23.48)	
More than four	6 (6.74)	

Sensitizations in monosensitized patients		Table 4.
	N patients (%)	
5Grasses/4cereals	61 (53.51)	
HDM	41 (35.39)	
<i>Alternaria</i>	4 (3.51)	
<i>Cladusporium</i>	1 (0.88)	
Cat dander	1 (0.88)	
<i>Fagaceae</i>	1 (0.88)	
<i>Betulaceae</i>	4/(3.51)	

<i>Salicaceae</i>	1 (0.88)
Total 114 (100)	

The mean age of monosensitized and polysensitized adults at the time of diagnosis was evaluated and compared: 30.01 years (SD 8.85) in monosensitized and 30.88 years (SD9.75) in polysensitized (figure 1).

There was no significant difference in age of mono- and polysensitized patients at the time of diagnosis ($p > 0, 05$).

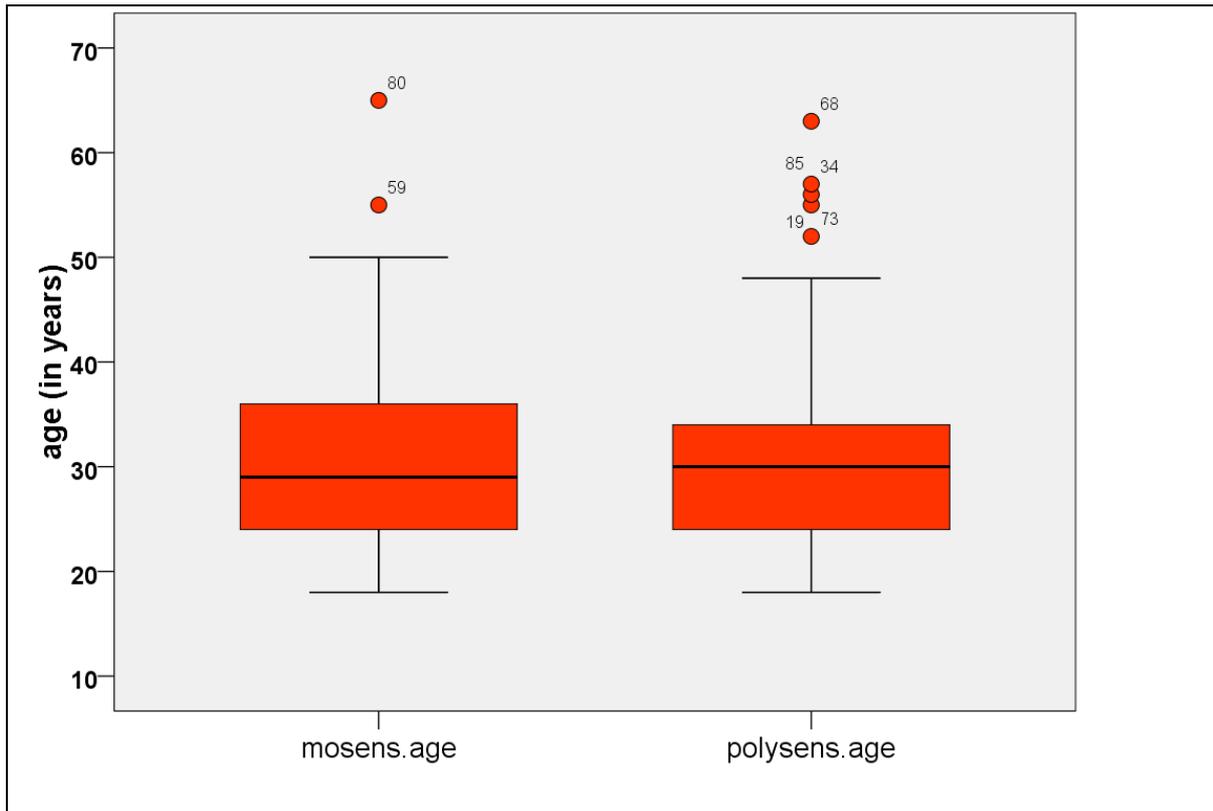


Figure 1. The mean age of mono – and polysensitised adults at the time of diagnosis.

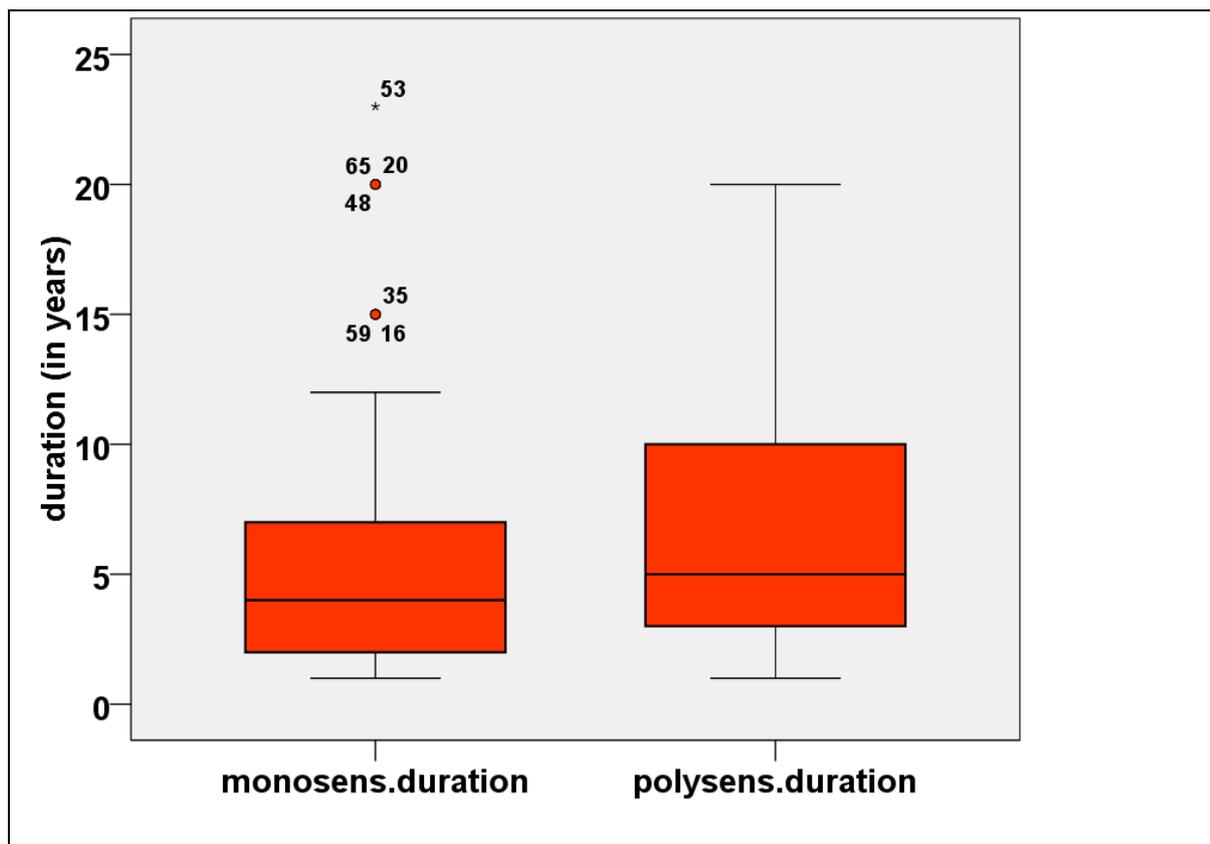


Figure 2. The duration of symptoms before diagnosis in mono – and polysensitized adults.

The duration of symptoms before diagnosis of allergic rhinitis was significantly higher in mono than in polysensitized patients: 5.12 years (SD 4.61) in monosensitized and 7.19 years (SD 5.61) in polysensitized ($p < 0.001$) { figure 2).

Discussion.

To characterize the sensitization of patients with allergic rhinitis is of great importance for the management of the disease.

There are publications demonstrating that mite allergen and grass pollen are the most relevant aeroallergens in both children and adults in Europe [4,8,14]. We confirmed the importance of those allergens. Sensitization to 5grasses/4cereals was the most relevant in both monosensitized and in polysensitized adults with AR as demonstrated the present study [5]. The next sensitization in prevalence was to HDM. We think this finding important since possibility of allergen – specific immunotherapy with HDM and grass pollen extracts.

Data from European publications pointed that the third frequent sensitization is to cat dander [10, 12]. Our study revealed a low prevalence of sensitization to pets. We found only one patient with AR, monosensitized to cat. The low rate could be explained by the relatively new phenomenon of pets in Bulgarian houses. Not as many households own pets in Bulgaria as in other European countries. Sensitization to cats was higher than dogs. It was connected to the characteristics of cat allergen, which could be detected even in houses without cats.

Ambrosia is known to be a relevant allergen in North America and recently in Europe. In

contrast to other European countries low level of sensitization to Ambrosia was detected.

The increasing number of sensitization seems to characterize the natural history of allergic patients. Polysensitization is clinically significant and relevant from an epidemiological point of view, as reported in some surveys [6,8]. Ciprandi et al. estimated that percentage of polysensitized patients may widely range from 20 to 90% [7]. Polysensitization is connected with more severe disease, affected quality of life and longer duration of symptoms. The clinical relevance of polysensitization was confirmed in our study.

We demonstrated no significant difference in age of mono- and polysensitized patients while the duration of symptoms was longer in poly- than monosensitized adults. This suggested the idea of adding new sensitizations is susceptible adults which is a natural history of allergy. It was interesting result, comparing to our previous study with children [14]. Fasce cited that polysensitization was a secondary phenomenon that always followed monosensitization [9]. Another research of Ciprandi demonstrated that monosensitized patients might remain in that state over time and mono and polysensitized patient with allergic rhinitis could constitute two different categories [7]. We could speculate that some immunological differences influence on the beginning of symptoms in predisposed patients. It could be the reason of AR with late onset. Our results demonstrate the importance of timely diagnosis and management of AR to prevent new sensitizations.

Conclusion.

Our study demonstrated the high prevalence of sensitization to grass pollen and HDM among adults with AR. Both types of allergies could be treated successfully in most patients with specific immunotherapy. We confirmed that polysensitization occurs frequently and depends upon the duration of symptoms. The results demonstrated the great importance of early diagnosis. It could prevent future new sensitizations by adequate management.

Conflicts of Interest

The authors declare that they have no conflicts of interest in relation to this article.

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