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A Single Center Study of Clinical and Paraclinical Aspects in Iranian Patients with Allergic Rhinitis

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ABSTRACT

Allergic rhinitis (AR) is a common form of allergic disorder in Iran and rest of the world. This study was conducted to investigate the symptoms and paraclinical aspects of this allergy among Iranian patients.

A total of 206 patients (51.5%: male), with one of the specific symptoms of AR, from March 2005 to March 2007 were enrolled in the study. A written questionnaire was completed for each patient. Furthermore, paraclinical evaluations including CBC, serum total IgE, spirometry and skin prick test (SPT) with common allergens were done for the patients.

The ages of our patients ranged from 2 to 62 years of age (mean age of 18 - /+11.8 years). Mean age of onset of symptoms was 11.6 -/+ 9.9 years. In 82% of cases histories of other allergic diseases were seen in patients or their family members. Rhinorrhea was the most common symptom in our patients (77.9%). Frequencies of mild persistent, moderate – severe persistent, mild intermittent and moderate –severe intermittent types of AR were 20.5%, 41%, 21% and 17.5%, respectively. Frequencies of positive SPTs in all cases, patients with persistent and intermittent allergic rhinitis were 86.7%, 88.2% and 84.1%, respectively. The most common allergens in positive SPTs, were trees, weeds, grasses and *Dermatophagoides pteronyssinus*. About 55.5 % of patients showed elevated total IgE levels (≥ 100 IU/ML). Abnormal spirometry results were seen in 33.5% of cases.

The present study showed that among paraclinical investigations for AR, positive SPTs with aeroallergens, are more consistent with clinical findings. Regarding high frequency of abnormal spirometry, we recommend that clinical suspicion about hyperreactive airway disease in AR patients is mandatory and performing spirometry for these cases is necessary whenever possible.

Key words: Allergic rhinitis; Allergens; Skin prick test; Spirometry

INTRODUCTION

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Allergic rhinitis (AR) is a heterogeneous disorder characterized by one or more symptoms, including sneezing, itching, nasal congestion, and rhinorrhea. Many causative agents have been linked to AR,

including pollens, molds, dust mites and animal danders.¹

AR is affecting between 10 and 40% of the global population.² Epidemiological evidence suggests that the prevalence of AR has been rising and rate of medical consultation for AR symptoms with general physician increased significantly in a 20 year period. Symptoms of AR develop before age of 20 years in 80% of cases.^{3,4}

The Allergic Rhinitis and its impact on Asthma (ARIA) group in conjunction with World Health Organization (WHO) have revised the new classification of AR including intermittent (experiencing symptoms for < 4 days/week or < 4 consecutive weeks) and persistent types (symptoms more than 4days/week and more than 4 consecutive weeks). Additionally, a severity scale of mild to moderate-severe was included in this revised classification. The mild type means that there is no disturbance in sleep, daily activities, leisure and/or sport, school or work performances. In any troublesome symptom, while in moderate-severe type, the patients have problem with at least one of the items that were mentioned later.²

In childhood, boys with AR outnumber girls, but in general, equal numbers are affected during adulthood.¹

Studies have shown that the frequency of AR increases with age and positive allergy skin tests are significant risk factors for the development of new symptoms of this disorder.⁴

AR symptoms have been found to impair not only cognitive processing, psychomotor speed, ability to sustain attention, verbal learning and memory, and mood, but also productivity in the workplace.^{5,6} The patients with AR frequently suffer from poor sleep quality, day time somnolence, and fatigue.⁷

The established association between asthma and AR has long been recognized.^{8,9} The term cough-variant rhinitis was proposed for children in whom cough is the principal presenting symptom of AR.¹⁰

Because of the high prevalence of AR, high costs of treatment, and presence of comorbidities such as asthma, sinusitis, and otitis media, AR has a tremendous impact on societies.^{11,12}

In this study, we have evaluated clinical and paraclinical characteristics of AR, to find out the probable similarities and differences between our patients and others.

PATIENTS AND METHODS

Patients were considered eligible for this study if they had one or more of the specific symptoms of rhinitis, according to ARIA classification and were referred to Allergy Clinic of the Children Medical Center Hospital, as the main allergy clinic for children and adults in Tehran University, Medical school. After thorough medical history and physical examination, a written questionnaire was completed for each patient.

Paraclinical examinations including CBC, total IgE measurement (enzyme- linked immunosorbent assay, ELISA), spirometry (initial tests for all cases and post-exercise and post-bronchodilator challenge tests in patients with normal and abnormal results of initial spirometries, orderly arranged) and SPT, using standardized allergen extracts (Allergopharma, Germany) were done for our cases. The serum total IgE ≥ 100 IU/ML was considered as elevated level.^{13,14} Exclusion criteria were negative results of all the above atopy evaluations.

Statistical analysis computation was performed using chi-square and t-tests. The results were considered to be significant when the P-value was less than 0.05.

RESULTS

A total of 206 patients were enrolled in the study from March 2005 through March 2007. Our patients ranged from 2 to 62 years of age (Mean age of 18 - /+11.8 years). Mean age of symptoms onset was 11.6 - /+ 9.9 years. About 51.5% of patients were male and 48.5% were female.

The prevalence of four types of AR according to new classification of ARIA in our patients is presented (Table 1).

The positive histories of allergic disorders in patients or their families were seen in 82% of our cases. Rhinorrhea (77.9%) was the most common symptom in enrolled subjects. Simultaneous complaint of all four specific symptoms of AR was significantly more than other conditions (33.7%, $p < 0.05$). Some of the results of clinical and paraclinical evaluations are being summarized (Table 1).

Positive results of post-bronchodilator challenge tests were seen in 82% of patients with obstructive pattern in initial spirometries. Post-exercise challenge

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Table 1. Clinical and paraclinical characteristics of the AR patients.

	intermittent AR (%)	Persistent AR (%)	Total (%)
Patients no	79	127	206
Sex (F)	34	61	100
(M)	40	66	126
Severity Age / year (mean)	17.4 (± 12.2)	18.4 (± 11.6)	18 (± 11.8)
Mild	44 (21)	42 (20.5)	86
Moderate	36 (17.5)	84 (41)	120
Clinical Symptoms			
Rhinorrhea	60 (75.9)	100 (78.8)	160 (77.7)
Sneezing	57 (72.1)	81 (63.6)	138 (67)
Nasal stuffiness	45(56.9)	96 (75.6)	141(68.4)
Nasal itching	43 (54.4)	76 (54.8)	119 (57.8)
Paraclinical Findings			
Eosinophilia ^I	14 (26.8)	46 (39.2)	65(34.6)
Elevated total IgE ^{II}	34 (49.3)	61 (51.3)	97 (50.5)
Positive SPT ^{III}	58 (84.1)	105 (88.2)	163 (86.7)
Abnormal PFT ^{IV}	22(36)	33 (32)	53 (33.5)

I. FEV1 or FVC ≤ 80% or at least 15% falls in these indices after exercise challenge test.

II. Serum total IgE levels ≥ 100 IU/ML.

III. Weal size of SPT with allergen extract being larger than negative control about 3 mm or more.

IV. ≥ 450 eosinophils in each micro liter of peripheral blood.

tests, were positive in 12% of patients with normal initial spirometries. About 69% of the cases with lower respiratory tract symptoms at exercise, showed positive post-exercise challenge tests. Among cases with positive results of post-exercise challenge tests, 24% were symptom free at rest exercise and 71% of them, had positive histories of exertional dyspnea.

The frequency of elevated serum total IgE in patients with positive results of SPTs was more than other patients and this difference was statistically significant (51.8 % vs. 21.6%, $p < 0.05$). The prevalence of wheezing in patients with persistent and intermittent AR were 39.8% and 34.2%, respectively ($p < 0.05$). The decrease of smell was seen in 21.7% of our cases, and

was significantly higher in moderate –severe persistent cases ($p < 0.05$).

The most common allergens in positive SPTs, in order of frequency, were trees, weeds, grasses, and *Dermatophagoides pteronyssinus*. The frequency of positive SPTs with food allergens was very low (5.3 % for peanut and pepper). The prevalence of lower respiratory symptoms in our patients with abnormal spirometry are presented (Figure 1). About 38.2% of patients reported symptoms of conjunctivitis, but difference between persistent and intermittent groups was not statistically significant ($p > 0.05$). Clinically, 35.4% of study cases had paranasal sinusitis, and polyposis was seen only in 2.9% of our patients.

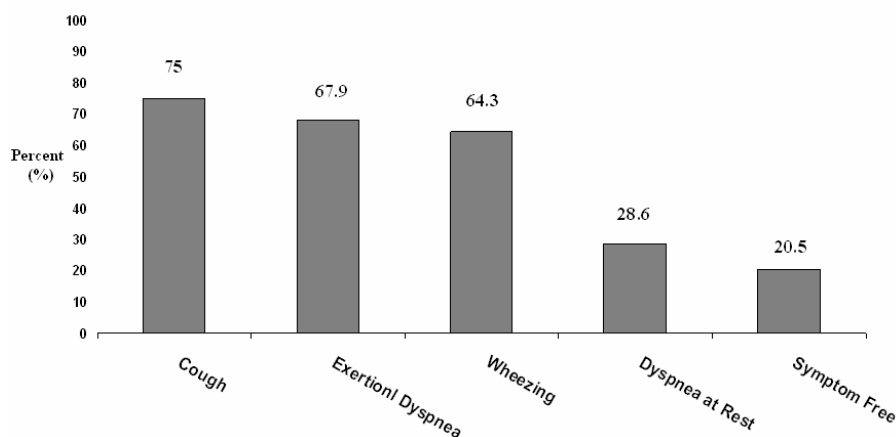


Figure 1. Frequencies of lower respiratory symptoms in AR patients with abnormal spirometry.

DISCUSSION

AR is usually found in conjunction with comorbid disorders such as asthma, sinusitis, and eustachian tube obstruction.

Mullarky and colleagues in a study in France on 142 patients with AR found that 58% of patients with seasonal AR had asthma.⁸ Another study in China on 1096 patients with AR, revealed asthma in 54% of the cases.¹⁵ A study by Bousquet *et al.* in France, identified obstructive pattern in spirometries of 24% of 591 patients with AR.¹⁶

Demoly *et al.* in a study of 12000 patients with AR but without any symptoms of asthma in France, demonstrated that about 30% of these patients had asthma according to patients' responses to a specific self-questionnaire.¹⁷ Consistent with recent studies, 33.5% of our patients had asthma according to spirometric indices, about half of them showed exercise-induced asthma (EIA). There is no statistically significant difference between patients with intermittent and persistent types of AR with respect to asthma involvement. Interestingly, 20.5% with AR and asthma had no complaint of lower respiratory tract symptoms. The sum results of our study and others emphasize on association between AR and asthma.

In a study, Kashef *et al.* in Shiraz city in south of Iran on 219 patients with AR found that, 62% of patients showed positive results of SPTs with common aeroallergens, and that weeds, grasses, and trees were, orderly arranged, the most common allergens with positive SPTs.¹⁸

Bousquet *et al.* demonstrated positive results in SPTs with common aeroallergens in 87% and 72% of patients with intermittent and persistent types of AR, respectively.¹⁶ In Switzerland, Tschopp and colleagues, in a study on AR patients and control group, have shown that SPT is the best predictive test for diagnosis of allergic rhinitis.¹⁹

Consistent with results of these studies, 86.7% of our patients had positive SPTs with common allergens trees, weeds, grasses and *Dermatophagoides pteronyssinus* orderly arranged were the four most common allergens.

There was no significant difference between patients with intermittent and persistent types of AR regarding rate of positive results in SPTs (88.2% vs 84.1%, $p > 0.05$).

In our study and in a study by Alyasin *et al.* about 80% of patients with AR were found to have positive histories of atopy themselves or in their families.²⁰

In this study we highlight the role of positive results of SPTs with aeroallergens, as a method of specific IgE detection in vivo, in conjunction with positive histories of atopy for diagnostic confirmation of AR.

The present study showed that among paraclinical investigations for AR, positive SPTs with aeroallergens, are more consistent with clinical findings.

Also according to the results of present study, we recommend that clinical suspicion about hyperreactive airway disease in AR patients should be mandatory and performing pulmonary function test for these cases is necessary whenever possible.

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