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DISTRIBUTION OF ALLERGENS AMONG ALLERGIC RHINITIS PATIENTS LIVING IN THE ANKARA REGION

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Objectives: To determine the distribution of allergens among allergic rhinitis patients living in Ankara region.

Patients and Methods: A total of 1128 patients with clinically suspected allergic rhinitis were examined by prick test. Of these, 708 patients (62.76%) exhibited positive prick test results.

Results: The most common allergen in the population tested was Dermatophagoides pteryssinus (mite 1) (n=484) (68.36%), while the next most common was Dermatophagoides farinae (mite 2) (n=424) (59.88%). Sensitivity for one allergen was seen in 156 patients (22.03%), 60 (8.47%) were sensitive to mite 1, 36 (5.08%) were sensitive to grass mix, 36 (5.08%) were sensitive to weed mix, 8 (1.12%) were sensitive to mite 2, 8 (1.12%) were sensitive to tree mix, and 8 (1.12%) were sensitive to an epidermal mix.

Conclusion: Allergic rhinitis appears to be a common disorder of adults in and around Ankara, having an incidence of 3.3% according to the medical records of Gazi University ENT clinic. The most common allergen in the population included in the study was Dermatophagoides pteryssinus, followed by Dermatophagoides farinae. The differences between the results of various studies were attributed to the different environmental and socioeconomic properties.

Key Words: Allergic rhinitis, allergens, skin tests.

ANKARA YÖRESİNDE ALERJİK RİNİTLİ HASTALARDA ALERJEN DAĞILIMI

Amaç: Çalışma, Ankara yöresinde alerjik rinitli hastalarda alerjen dağılımını saptamak amacıyla yapıldı.

Hastalar ve Yöntemler: Klinik olarak alerjik rinit ön tanısı alan 1128 hastaya epikütan olarak prick testi uygulandı. Deri testi pozitif olan 708 hasta (% 62,76) çalışmaya dahil edildi.

Bulgular: Dermatophagoides pteryssinus (mite 1) (n=484), (% 68,36), test edilen populasyonda en sık rastlanan alerjendi. İkinci sıklıkla Dermatophagoides farinae (mite 2) (n=424) (% 59,88) saptandı. Sadece bir alerjene hassasiyet 156 hastada (% 22, 03) görüldü. 60 (% 8,47) hasta mite 1'e, 36 (% 5,08) hasta çimen karışımına, 36 (% 5,08) hasta yabani ot karışımına, 8 (%) 1, 12 hasta mite 2'ye, 8 (% 1,12) hasta ağaç karışımına, 8 (% 1,12) hasta epidermal karışıma hassas olarak bulundu.

Sonuç: Alerjik rinit, Ankara ve çevresinden gelen hastalarda Gazi Üniversitesi Kulak Burun Boğaz kliniğinin kayıtlarında %3,3 gibi bir insidansa sahip, yaygın bir hastalık olarak öne çıkmaktadır. Aynı çevrede en sık rastlanan alerjenler Dermatophagoides pteryssinus ve Dermatophagoides farinae olarak tespit edilmiştir. Çalışmaların sonuçlarının farklı olmasının nedeni, değişik çevresel ve sosyoekonomik özelliklerdir.

Anahtar Sözcükler: Alerjik rinit, alerjenler, cilt testleri.

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INTRODUCTION

Allergic rhinitis (AR) represents a global health issue, affecting 10% to 25% of the world's population, with increasing prevalence over the last decade (1, 2). Although often trivialized by patients and doctors, allergic rhinitis is a significant cause of morbidity, causing social embarrassment on account of the rhinitis and on account of the widespread mucosal inflammation affecting several target organs as well as a general feeling of malaise that impacts on and impairs both work and school performance. The socioeconomic impact of allergic rhinitis is substantial when one considers the costs, which not only relate to the costs of management but also to the considerable indirect costs, through reduced productivity and absenteeism from work. Moreover, the cost of treating conditions associated with allergic rhinitis, such as asthma, sinusitis, otitis media, nasal polyposis and lower respiratory tract infection, should not be underestimated (3).

AR is characterized by nasal itching, sneezing, watery rhinorrhea, and nasal obstruction. Additional symptoms such as headache, impaired smell, and conjunctival symptoms can be associated (4). The new classification of AR is based on ARIA guidelines and subdivided by the duration of the disease into 'intermittent' or 'persistent', and by the severity of the disease into 'mild' or 'moderate-severe' (5).

Management of patients with allergic rhinitis consists of environmental modification, pharmacotherapy and immunotherapy. Incorporating these modalities into a treatment plan individualized for the patient results in maximum benefit (6).

When an allergic pathogenesis of the disease is suspected, the skin prick test (SPT) with standardized allergens should be performed. Immediate hypersensitivity skin testing is the standard clinical procedure for identifying allergen-specific IgE in allergic patients (7). As sensitization to an allergen does not necessarily mean that the individual patient suffers from clinical disease, the clinical relevance of skin or specific IgE results should be demonstrated before introducing therapies such as immunotherapy or environmental control.

This study was performed to determine the distribution of allergens among allergic rhinitis patients living in and around Ankara region.

MATERIALS AND METHODS

Between 2003 and 2005, 21253 patients were admitted to the Ear, Nose and Throat clinic of Gazi University. This prospective study conducted between 2003 and 2005 included 1128 patients with clinically suspected allergic rhinitis who underwent a skin prick test.

Application and Reading of Skin Tests

All patients were skin-prick tested using a Multi-Test™ device (Lincoln Diagnostics, Inc). The volar surface of the forearm was cleaned with isopropyl alcohol on sterile cotton and allowed to air dry. Diagnostic allergenic extracts, i.e. grass mix, tree mix, weed mix, mold mix, mixed epidermals and mites (Dermatophagoides farinae and pteronyssinus), in 50% glycerosaline supplied by Center Laboratories, were applied at concentrations of 1:20 (wt/vol) and 10,000 AU/ml, respectively. The positive control was histamine (1 mg/ml). The negative control solution was 50% glycerosaline. Histamine reactions were read at 10 min, in keeping with the histamine manufacturer's recommended reading time of 8-10 min after administration. Negative controls were read at 20 min, which is consistent with the extract manufacturer's recommended reading time of 15 to 20 min for negative controls and extracts.

Wheal sizes were calculated as the average of the longest diameter and its midpoint orthogonal diameter, traced with a fine-tipped felt pen and transferred by tape to permanent records.

A positive reaction was defined as a wheal of a geometric mean diameter of at least 4 mm after 20 min, in the presence of a positive histamine reaction.

Before the skin test, medications were withheld for the following periods: astemizole, 3 months; other antihistamines, 7 days; antidepressants, 14 days; and histamine H-2 antagonists, 24 hours.

RESULTS

The allergy test results of 1128 patients with a clinical diagnosis of AR were reviewed. The results were positive in 708 patients (62.76%). The mean age of the patients was 41.7 (1-79±10); 260 (36.72%) were men and 448 (63.28%) were women. The symptoms of 216 (30.50%) patients were permanent and those of 492 (69.50%) patients were intermittent. A family history of AR was present in 160 (22.59%) patients, of drug allergy in 144 (20.33%) patients, of urticaria in 140 (19.77%) patients, of asthma in 136 (19.20%) patients, and of more than one allergic disorder in 124 (17.51%) patients. The demographic data and positive skin prick test reactions to common allergens in patients with AR are shown in Tables 1 and 2.

The most common allergen in the population tested was Dermatophagoides pteryssinus (mite 1) (n=484) (68.36%), followed by Dermatophagoides farinae (mite 2) (n=424) (59.88%). Sensitivity to one allergen was seen in 156 patients (22.03%), 60 (8.47%) were sensitive to mite 1, 36 (5.08%) were sensitive to the grass mix, 36 (5.08%) were sensitive to the weed mix, 8 (1.12%) were sensitive to mite 2, 8 (1.12%) were sensitive to the tree mix, and 8 (1.12%) were sensitive to the epidermal mix.

DISCUSSION

In the past 20 years, significant progress has been made in the treatment of AR. Nonetheless, there has been a concomitant worldwide increase in the prevalence of allergic disease, which has now reached epidemic proportions in developed countries. Because the rate of this rise cannot be explained entirely by alterations in the human gene pool or diagnostic techniques, changes in environmental factors must be considered (8).

The triggering event of AR is the contact of the responsible allergen with the nasal mucosa. The severity of the disease and its natural course correlate well with the allergen concentration in the environment. Thus, the first therapeutic approach to the control of symptoms is prevention, by identification and avoidance of the causal allergen(s) (4).

When an allergic pathogenesis of the disease is suspected, the skin prick test (SPT) with standardized allergens should be performed. Immediate hypersensitivity skin testing is the standard clinical procedure for identifying allergen-specific IgE in allergic patients (7).

The SPT positivity rate is reported between 45.8% and 79% in patients with a clinically evident AR. In our study, the positivity rate is 62.76% and is compatible with the rates in the literature (9-14).

Allergic rhinitis is a multifactorial disease and its symptoms can start at any age, but mostly before the age of 30; in our study, 198 patients (55.92%) were between the age of 20 and 40.

Table 1: Demographic data.

Age	Men	%	Women	%	Total	%
0-10	40	5.65	28	3.96	68	9.61
11-20	28	3.95	52	7.35	80	11.30
21-30	76	10.73	148	20.90	224	31.63
31-40	44	6.22	128	18.08	172	24.30
41-50	36	5.09	64	9.04	100	14.13
51-60	28	3.95	16	2.26	44	6.21
>60	8	1.13	12	1.69	20	2.82
Total	260	36.72	448	63.28	708	100

Table 2: Reactions to common allergens.

Allergens	Pts number	ratio	Positive for one allergen	ratio
Dermatophagoides pteryssinus	484	68.36	60	8.47
Dermatophagoides farinae	424	59.88	8	1.12
Grass mix	336	47.45	36	5.08
Weed mix	260	36.72	36	5.08
Mixed epidermals	228	32.20	8	1.12
Tree mix	148	20.90	8	1.12
Mold mix	104	14.68	0	0

The female to male ratio for AR is given as equal in Noble's work (6). Rasmuson et al. (15), Çanakçıoğlu et al. (16) and Erbudak et al. (17) gave the female to male ratio as 2 to 1. In an Italian study, it was slightly higher in men (16.3%) than in women (15.5%) although not significantly different (p=0.39) (9). In our study, we found a female to male ratio of 1.74 to 1.

Data on the epidemiology of patients with allergic rhinitis are quite scant in Turkey. A questionnaire study performed with 4331 university students in Ankara revealed a prevalence of perennial rhinitis of 1.6% and seasonal rhinitis of 6.4% (18). In another study, in a factory in Afyon/Çay, 10 (1.3%) of the 784 adults had seasonal rhinitis and 36 (4.6%) had perennial rhinitis (19). A nationwide multicenter study including 1149 asthmatics revealed perennial rhinitis in 34% and seasonal rhinitis in 1.3% (20). In our study, we revealed a prevalence of intermittent rhinitis in 492 (69.50%) patients and persistent rhinitis in 216 (30.50%).

When we classify specific allergens and look at their frequency distribution, we find that the highest SPT positivity is in the group of mite 1 (68.36%), followed by mite 2 (59.88%), the grass mix (47.45%), the weed mix (36.72%), mixed epidermals (32.20%), the tree mix (20.90%), and the mold mix (14.68%).

In Erel and coworkers' study of 2342 cases in Central Anatolia, sensitization to pollens was 59.7%, to pollens and molds 2.9%, to pollens and house dust 11.5%, and to pollens, molds and house dust 2%. Grass pollen sensitivity was three times more common than that for trees, and four times more common than that for weed pollens (21). Tezcan et al., in their study of 5055 cases in the Aegean region, found a grass pollen sensitivity rate of 54%, a cereal pollen sensitivity of 45% and a wild grass pollens sensitivity of 20%; 14% of patients were sensitive to trees I and 17% to trees II (12). In Sener and coworkers' comparison of skin tests to aeroallergens in Ankara (Central Anatolia) and Seoul, grass pollens were found to be major allergens more often in Ankara than in Seoul (74.3% vs. 15.8%, p<0.001). Skin test reactivity in Ankara was significantly lower than those in Seoul to weed (6.9% vs. 37.5%) and tree pollens (4.6% vs. 39.4%) (22).

In our study, there was a prevalence of aeroallergens for the grass mix (47.45%), weed mix (36.72%), and tree mix (20.90%).

Local prevalence studies in various regions of Turkey found different sensitivity rates to house dust mites. In Güneser and coworkers' study of 614 cases in the Eastern Mediterranean region, house dust seemed to be the most important allergen (65.7%) (p<0.05). Mite 1 and mite 2 sensitivities were 60.1% and 44.7%, respectively (23). In Tezcan and coworkers' study of 5055 cases in the Aegean region, 37% of the patients were allergic to mite 2 and 42% to mite 1 (12). Sener and coworkers' comparison of skin tests to aeroallergens in Ankara (Central Anatolia) and Seoul showed that allergic reactions to indoor allergens were significantly higher in Seoul than in Ankara (p<0.001) (house dust mites, 83.17% vs. 33%) (22). Sin and coworkers, in their study of 277 cases in the Aegean region, found that the highest sensitivity was to house dust mites (81.1%) (13). In our study, we observed a sensitivity of 68.36% to mite 1 and of 59.88% to mite 2.

In conclusion, allergic rhinitis appears to be a common disorder of adults in Ankara, with an incidence of 3.3% according to the medical records of Gazi University ENT clinic. The most common allergen in the population included in the study was Dermatophagoides pteryssinus, followed by Dermatophagoides farinae. The differences between results of various studies were attributed to the different environmental and socioeconomic properties.

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