

RESPIRATORY ALLERGENS IN ORADEA CITY

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Abstract

Allergic respiratory diseases are currently increasing all over the world. To characterize the most frequent respiratory allergens and the prevalence of respiratory allergic disorders in Oradea city, the blood samples of 20 patients registered by Biostandard Laboratory were analysed. The study showed that the majority of patients are children aged under 15 years (55%). The proportion of the patients in terms of gender was 55% female and 45% male. The study included 17 types of most commonly respiratory allergens, each of them being found in different concentration in the blood samples analyzed. The most commonly found allergens were grain pollen in children and late grass pollen and cultivated rye pollen in adults. The allergens found in blood samples of women are early grass pollen and grain pollen and the most commonly found in men are late grass pollen followed by early grass pollen and grain pollen.

Key words: respiratory allergic disorders, aeroallergens, bronchial asthma, allergic rhinitis, grain pollen.

INTRODUCTION

The air pollution is a major environmental health problem affecting the population in developed and developing countries alike. Indoor and outdoor air pollution is a risk factor for human health that may cause not only minor biochemical and physiological changes, breath difficulties, cough, aggravation of existing respiratory and cardiac diseases but has a major impact in the increasing incidence of allergies, asthma and even death of affected individuals (GINA, 2009; Kay A.B., 2000; <http://www.medicinenet.com>).

Allergic reactions are caused by allergens to which allergic people have become sensitized. Agents causing respiratory allergy in humans are of biological origin and are collectively known as bio-aeroallergens. Aeroallergens play a major role in the pathogenesis of respiratory allergic diseases. Pollen from trees and grasses, house dust mites, fungal spores, moulds, animal dander from domestic pets are the most predominant aeroallergens. They are more or less the same for different countries from different geographical locations with similar and even with different climate (Singh A.B., Kumar P., 2002; Hasnain S.M. et al., 2012; Boulet L.P. et al., 1997; Jedrychowski W. et al., 2000; Arshad S.H. et al., 2001; Sattar H.A. et al., 2003; Montealegre F. et al., 2004).

While these aeroallergens do not normally cause anaphylaxis, they can cause allergic disorders such as bronchial asthma which affects the lungs, allergic rhinitis (hay fever) which affects the nose and eyes and atopic dermatitis (eczema) which affects the skin (<http://www.allergyuk.org>; Singh A.B., Kumar P., 2002; Singh A.B., Kumar P., 2003).

Allergic respiratory diseases are currently dramatically increasing all over the world affecting all age groups but the children are by far the most affected and sensitive. Epidemiological data from different countries indicate the prevalence of respiratory allergies as 15-30%. Thus, there is a prevalence of 20-30% allergic rhinitis among the Indian population, 14% allergic rhinitis and 2.5% asthma in Finland, 27% respiratory wheeze among Australian children, 9% asthma among Greek population (Singh A.B., Kumar P., 2003; Pekkanen J. et al., 1997; Woolcock A.J. et al., 2001; Anthracopoulos M. et al., 2001).

As a developing country, Romania is on the upward slope for the prevalence of allergic diseases but we are still below the level of economically developed countries. Thus, allergic rhinitis in Romania is diagnosed in 8-10% of adolescents compared to 15-30% in economically developed countries (<http://www.saptamanamedicala.ro>).

MATERIAL AND METHOD

This study included patients who were sent for medical tests to Biostandard Laboratory in Oradea in the period January 1st, 2014 – June 30th, 2014. A total of 20 patients were studied, namely those whose blood samples showed significant concentrations of allergens. Blood samples analyses were performed by means of tests which used EurolineScan software. The concentrations of allergens in the blood samples were expressed in units characteristic to every test. All the results higher than 0.35 units/L were considered positive for the studied allergen (Şeican M., 2014).

RESULTS AND DISCUSSION

Socio-demographic characteristics of patients – age and gender

For a good screening on the patients' sensitivity to aeroallergens, we studied in the beginning their socio-demographic characteristics – age and gender. Upon categorization, age category showed that 55% of the patients were children between the ages of 2-15 years (11 patients), 40% were adults between the ages of 20-45 years (8 patients) and 5% were old people over 60 years (1 patient). The proportion of the patients in terms of gender was 55% female and 45% male (Fig. 1-2).

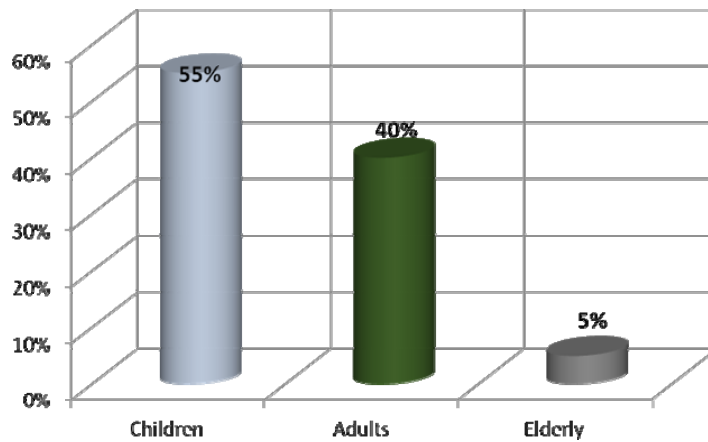


Fig. 1. Socio-demographic characteristic of patients – age

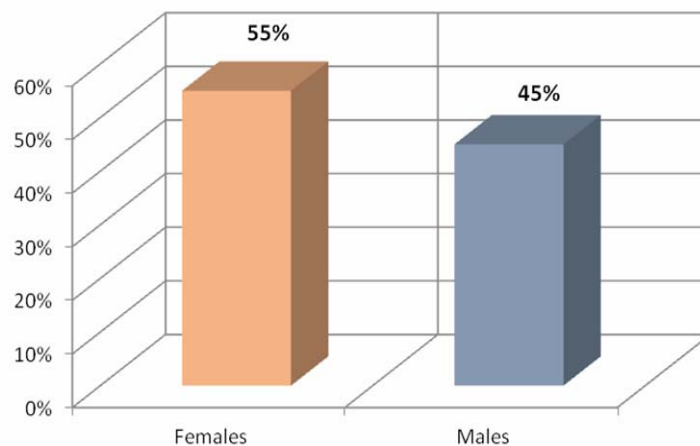


Fig. 2. Socio-demographic characteristic of patients – gender

Types of aeroallergens

Bioparticles from different biological sources can be considered bioallergens and the main cause of allergic diseases. Pollen of grasses, flowers, weeds, agricultural plants or trees, dust mites *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus*, fungal spores, molds, cats and dogs epithelia, insects, cockroaches, house flies and other materials of biological origin form the most important allergens in the air (aeroallergens) and the most commonly studied taking into account that allergic diseases affecting the respiratory system are very common.

The study conducted on 20 patients included 17 types of most commonly respiratory allergens in Oradea (Tables 1-3, Fig. 3).

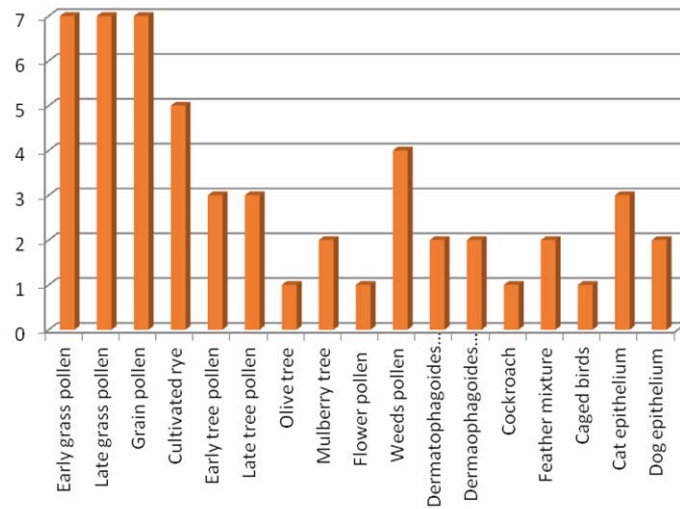


Fig. 3. The frequency of respiratory allergens in patients studied

Table 1

Clinically important aeroallergens

Patients	Early grass pollen	Late grass pollen	Grain pollen	Cultivated rye	Early tree pollen	Late tree pollen
1	yes	no	no	no	no	yes
2	yes	yes	no	yes	no	no
3	no	no	yes	no	yes	no
4	yes	no	no	no	yes	no
5	yes	yes	yes	yes	no	yes
6	yes	no	no	no	no	no
7	no	no	no	no	no	no
8	no	yes	yes	no	no	no
9	no	yes	yes	no	yes	no
10	no	no	yes	no	no	no
11	no	no	yes	no	no	no
12	yes	no	no	no	no	no
13	yes	no	no	yes	no	no
14	no	yes	yes	yes	no	no
15	no	no	no	no	no	no
16	no	yes	no	yes	no	no
17	no	no	no	no	no	no
18	no	yes	no	no	no	no
19	no	no	no	no	no	no
20	no	no	no	no	no	yes

Table 2

Clinically important aeroallergens

Patients	Olive tree pollen	Mulberry tree pollen	Flowers pollen	Weeds pollen	D. pteronyssinus	D. farinae
1	no	no	no	no	no	no
2	yes	no	no	yes	no	no
3	no	no	no	no	no	no
4	no	no	no	no	no	no
5	no	no	no	no	no	no
6	no	no	no	yes	no	no
7	no	no	no	no	yes	no
8	no	yes	no	no	no	no
9	no	no	no	no	no	yes
10	no	no	no	no	no	yes
11	no	no	no	no	no	no
12	no	no	yes	no	yes	no
13	no	no	no	no	no	no
14	no	no	no	no	no	no
15	no	yes	no	no	no	no
16	no	no	no	no	no	no
17	no	no	no	no	no	no
18	no	no	no	no	no	no
19	no	no	no	yes	no	no
20	no	no	no	yes	no	no

Table 3

Clinically important aeroallergens

Patients	Cockroach	Feathers mixture	Caged birds	Cat epithelium	Dog epithelium
1	no	no	no	no	no
2	no	no	no	no	no
3	no	no	no	yes	no
4	no	no	yes	no	no
5	no	no	no	yes	no
6	no	no	no	no	yes
7	no	no	no	nu	no
8	no	no	no	nu	no
9	no	no	no	nu	no
10	no	no	no	nu	no
11	no	no	no	yes	no
12	no	yes	no	no	no
13	no	no	no	no	yes
14	no	no	no	nu	no
15	no	no	no	nu	no
16	no	no	no	nu	no
17	no	yes	no	no	no
18	no	no	no	no	no
19	no	no	no	no	no
20	yes	no	no	no	no

As can be seen in the tables 1-3 and figure 3, the most common respiratory allergens are early grass pollen, late grass pollen and grain pollen which had been found in 7 cases of patients, while allergens like olive tree pollen, flowers pollen, cockroach and caged birds affected only one patient, respectively.

The frequency of aeroallergens in patients – age and gender study

Studying allergens in terms of patients’ age showed that in the case of the 11 children examined, most often detected allergen was the grain pollen followed by early grass pollen. In adults, 3 of 8 patients studied were affected by late grass pollen and cultivated rye pollen, respectively. The 65 years old patient is allergic to late tree pollen, weeds pollen and allergens produced by cockroaches (Tables 1-3, Fig. 4-5).

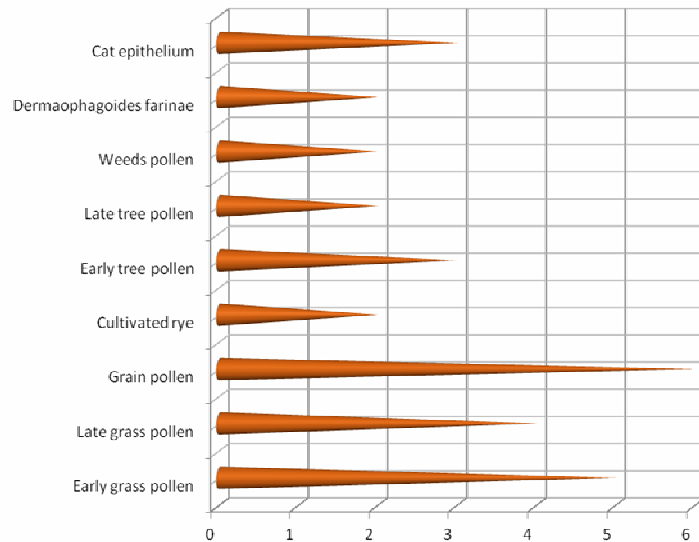


Fig. 4. The frequency of respiratory allergens in children

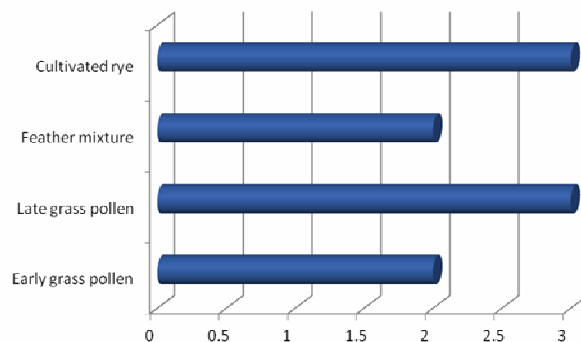


Fig. 5. The frequency of respiratory allergens in adults

Women were affected differently than men by allergens. The allergens found in blood samples of women are early grass pollen and grain pollen and the most commonly found in men are late grass pollen followed by early grass pollen and grain pollen (Fig. 6).

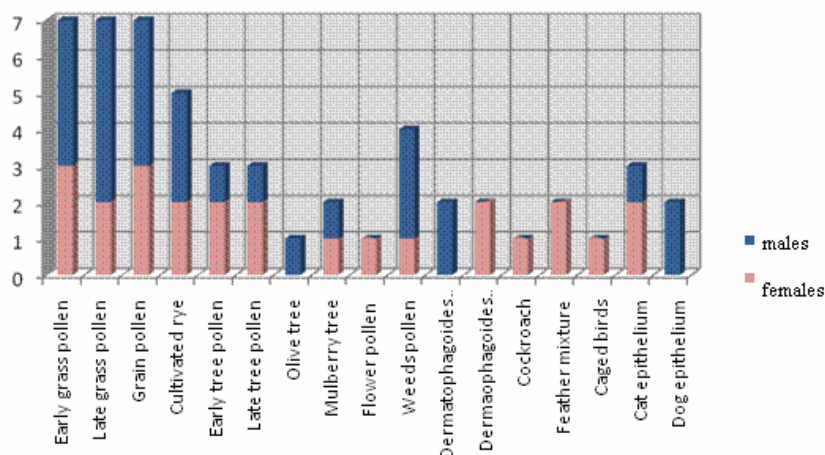


Fig. 6. The frequency of respiratory allergens in women and men

CONCLUSIONS

The study of frequency and types of aeroallergens on 20 patients in Oradea city showed the dominance of grass pollen, grain pollen and cultivated rye pollen among the 17 types of most commonly respiratory allergens. Their allergenicity to patients varies according to age and sex. The most commonly found allergens were grain pollen in children and late grass pollen and cultivated rye pollen in adults. The allergens found in blood samples of women are early grass pollen and grain pollen and the most commonly found in men are late grass pollen followed by early grass pollen and grain pollen.

Reduced exposure to these aeroallergens will help to control the raising of respiratory allergies.

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