Prevalence of common allergens among patients with atopic dermatitis in Eastern Iran

Abstract

Background and aim: Atopy is a common cause of disease and has caused many health problems in humans today. Different allergens are the main cause of allergy symptoms. Identifying environmental allergens is a major challenge in allergic diseases, and the only way to cure these diseases is to avoid them. The aim of this study was to evaluate the Prevalence of Common allergens in patients with atopic dermatitis in Birjand, eastern Iran. Materials and Methods: In this cross-sectional descriptive study, 31 patients referring to specialized skin clinics in the city of Birjand with atopic dermatitis in 2017, which tended to participate in the study, Diagnosis of atopic dermatitis by a dermatologist based on Hanifin and Rajka criteria. After sampling, IgE levels were evaluated against 54 food allergens and inhalers in serum samples of each patient. The data were analyzed using SPSS software and Chi-square or Fisher tests at the level of α=0.05.

Results: The subjects were 31 patients (mean age 38.6±18.2). 58.1% (18 patients) were male and the 41.9% (13 patients) were female. Among pollen allergens, pollen, grasses and cockroaches were the most frequent as follows: Pollen included: Cypress 35.5% (11person), Oak 25.8% (8person), ragweed 12.9% (4person), Weeds and grasses include: Cultivated rye 29.1% (9person), Sweatvernal grass 29.1% (9person), Orchardgrass 22.6% (7person), Mugwort 22.5% (7person), Timothygrass 16.1% (5person) and Cockroach 25.8% (8person). Among food allergies, potatoes 45.2% (14person), apples 32.2% (10person), cow milk 29% (9person), soybeans 25.9% (8person) and Almond 22.6% (7person) were the most frequent. The frequency of food allergens and inhalers with age, sex and occupation did not have a significant relationship. The frequency of respiratory allergies (P=0.001) and food allergies (P=0.02) was significantly higher in those who contact with weeds and grasses.

Conclusion: Among aeroallergens, sensitivity to pollen, grass, and cockroaches was high, and in food allergens, potato, apples, cow milk and almonds were the most frequent. By identifying and determining the common allergens in the region, it is possible to provide the patients with the necessary recommendations in order to control and prevent the disease. According to the results of this study, the prevalence of susceptibility to food allergens and inhalation is different depending on the nutritional habits and living conditions.

Keywords: atopy, food allergen, aero allergen, RAST test

Introduction

An allergy is a hypersensitivity reaction of the immune system to various factors. These symptoms appear after contact with an allergenic agent (allergen). Allergic or allergenic substances are all substances that can cause allergic in susceptible to allergies. Allergens have different types, including inhalants, food, contact, occupational, and injectable. Inhalation allergens in allergic diseases (atopy) are very important. These types of allergens are classified indoors and out door allergen. The indoor allergens include mites, Cockroach, pets, mold, and andfungus. Of course, other factors such as tobacco smoke, color smell and detergents are also important as immune system stimulants. Outdoor allergens include pollen from trees, grasses, grasses, weeds, dust, molds and fungi. Environmental pollutants should also be considered as stimuli.

Food allergy is an abnormal body reaction to a food that is caused by the IgE produced in the body against that nutrient. The most common food allergies are milk and dairy products, eggs, peanuts, nuts, and gluten containing cereals (eg wheat, rye, barley), soy beans, mustard, fish and shellfish. Food allergies are associated with a wide range of clinical disorders that vary in severity from one age to another. The rate of involvement of various tissues in food allergies is 86% in the skin, 71% in the digestive system and 38% in the respiratory tract. Therefore, identification of allergenic substances in the treatment and prevention of allergic diseases is very important.

To identify allergens, in addition to the history and clinical examination, various laboratory tests are used. Below are two brief descriptions of the two most commonly used tests. Skin prick test is an appropriate test for immediate response (type 1 allergy), which shows the specific IgE bonded to the skin, and which represents the atopy of the patient. In this method, one drop of allergen was placed on the forearm of the patient. In this method, one drop of allergen was placed on the forearm and arm of the patient, and with a needle, a slight scaly scratches were made and after 15 minutes the reaction was compared with positive control (histamine) and negative control (normal saline). A response greater than 3 millimeters or Wheal or a redness of more than 10 mm
is considered as a positive test. Diagnostic Test of RAST Diagnostic testing is performed on a patient’s blood sample to determine specific IgE levels against that particular allergy.\textsuperscript{14}\n
Atopy is a kind of hypersensitivity reaction include asthma, hay fever (allergic rhinitis), and atopic dermatitis.\textsuperscript{10} The prevalence of atopic diseases has increased Significant in recent decades.\textsuperscript{11} In some industrialized countries, the prevalence rate has been estimated to be 40%. There is no detailed history of the overall outbreak of allergies in Iran. Regional studies shows that the prevalence of allergies in our country can be over 20%.\textsuperscript{12,14} The prevalence of atopic dermatitis in children in advanced countries is between 15% and 20%. The incidence of asthma, especially in children aged 13 to 14 years, varies from 1.6% to 36.8%, which is the highest radar outbreak in developed Western countries. The prevalence of allergic rhinitis in the general population of all ages is between 10% and 40% in different parts of the world.\textsuperscript{1}\n
Atopic dermatitis is a chronic inflammatory disease of the skin that can affect all age groups. Although it's rare before the age of two and after 50 years of age. It contains a series of rashes, itchy and recurrent episodes. Although the shape of the lesions and the diffusion of the disease varies in different ages, itching is often the main symptom; Atopic inflammation begins suddenly with severe erythema and itching, and after scratching, the surface of the skin is altered and lichenification occurs.\textsuperscript{15} Asthma is a chronic inflammatory disease of the respiratory tract and is relatively common, especially in childhood. Clinical symptoms include cough, wheezing, and less frequent shortness of breath, known as asthma triplets. The cause of multifactorial disease is genetic factors and environmental factors.\textsuperscript{2} one of the environmental factors are various airborne allergens.

Allergens are airborne particles that cause allergic reactions in susceptible people, including respiratory allergens.\textsuperscript{3} Allergic rhinitis is the most commonly diagnosed allergic disease in different parts of the world.\textsuperscript{3} In this disease, nasal inflammation occurs following exposure to IgE-mediated allergens. Clinical symptoms typically include sneezing, pruritus, cramping and Rhinorrhea, often associated with conjunctivitis or corneal inflammation.\textsuperscript{14} Allergic rhinitis is divided into all types of seasonal (20%) and permanent (40%) or combined (40%). In the seasonal type of outbreak of allergies, such as pollen trees, grass and various causes Other role plays, but in permanent form, indoor allergens such as mites, dust mite or crust of animal, Cockroach and molds.\textsuperscript{3}

### Materials and methods

In this cross-sectional descriptive study, 31 patients referring to specialized skin clinics in the city of Birjand with atopic dermatitis in 2017, which tended to participate in the study, and diagnosis of atopy by a dermatologist based on Hanifin and Rajka criteria. Major criteria: itching, personal or family history of erythema (asthma, allergic rhinitis, atopic dermatitis), history of chronic or recurrent dermatitis, and minor criteria: skin dryness, wool intolerance, food intolerance, aggravated by environmental changes and stress, A tendency to cutaneous infections, ichthyosis Etc. A patient with atopic dermatitis must have at least 3 main criteria and 3 sub criteria for confirmation.\textsuperscript{16} The research tool was a researcher-made questionnaire on patient’s personal information about age, sex, occupation, education level, as well as questions about contacting with common food and inhalation allergens (Cockroach, pollen, polluted air and dust, grass and weed, Mushrooms, mites and having a pet) or having a personal or family history of allergic diseases such as having certain allergies or having symptoms like sneezing and Rhinorrhea . The questionnaire had 10 questions, which was designed with options yes (1) and no (2). After collecting all samples and preparing kits, experiments were performed on samples. We examined serum IgE level against 54 food and inhalation allergens. The data were analyzed using SPSS software and Chi-square or Fisher tests at the level of α= 0.05.

### Finding

This study was performed on 31 atopy patients with an average age of 18.6±38.6 with a minimum age of 15 and a maximum age of 82 years. 58.1% of the patients were male and the other (41.9%) were female. the distribution of food allergens by gender was 55.6% in men and 53.8% in women. The distribution of inhaler allergens by gender was 50% in men and 53.8% in women, so the distribution of allergens in both sexes was the same. The patients were divided into five groups according to the level of education; most of them had high school education (32.3%) secondary education (32.3%). In addition, patients were divided into three groups: age group less than 30 years old (41.9%) and 30 to 59 years old (45.2%) and 60 Year and above (12.9%). According to the data of this study, the highest inhalation allergens in the studied subjects were Cypress (35.5%), Cultivated rye (29.1%), Sweatvernal grass (29.1%), Cockroach (25.8%), Oak (25.8%), Orchardgrass (22.6%), Mugwort (22.5%), Timothygrass (16.1%), Common ragweed (12.9%) (Table 1).

### Table 1 Frequency distribution of inhaled allergens in patients under study

| Antibodi/Allergy type | No antibodi Frequency (%) | Asymptomatic and weak antibodies (1) Frequency (%) | Weakantiby and symptomaticat high levels Frequency (%) | Significant antibodi and symptomatic Frequency (%) | Total Frequency (%) |
|-----------------------|---------------------------|-----------------------------------------------|-------------------------------------------------|------------------------------------------------|-------------------|
| Dermatophagoides pter | 28(90.3)                  | 3(9.7)                                        | -                                               | -                                               | 31(100)           |
| Dermatophagoides farina | 28(90.3)                  | 3(9.7)                                        | -                                               | -                                               | 31(100)           |
| Cockroach             | 23(74.2)                  | 7(22.6)                                       | -                                               | 1(3.2)                                          | 31(100)           |
| House dust            | 31(100)                   |                                               | -                                               | -                                               | 31(100)           |
| Cat                   | 29(93.5)                  | 1(3.2)                                        | -                                               | 1(3.2)                                          | 31(100)           |
| Dog                   | 30(96.8)                  | 1(3.2)                                        | -                                               | -                                               | 31(100)           |
| horse                 | 28(90.3)                  | 3(9.7)                                        | -                                               | -                                               | 31(100)           |
| Penicillium notato    | 29(93.5)                  | 2(6.5)                                        | -                                               | -                                               | 31(100)           |
Table Continued...

| Antibody/Allergy type         | No antibody Frequency (%) | Asymptomatic and weak antibodies (1) Frequency (%) | Weak antibody and symptomatic at high levels (2) Frequency (%) | Significant antibody and symptomatic Frequency (%) | Total Frequency |
|-----------------------------|---------------------------|---------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|-----------------|
| Cladosporium herbarum       | 27(87.1)                  | 4(12.9)                                           | -                                                             | -                                                 | 31(100)         |
| Aspergillus fumigates        | 31(100)                   | -                                                 | -                                                             | -                                                 | 31(100)         |
| Alternaria alternate         | 30(96.8)                  | 1(3.2)                                            | -                                                             | -                                                 | 31(100)         |
| Sweatvernal grass            | 22 (71.0)                 | 5(16.1)                                           | 4(12.9)                                                       | -                                                 | 31(100)         |
| Orchardgrass                 | 24(77.4)                  | 3(9.7)                                            | 4(12.9)                                                       | -                                                 | 31(100)         |
| Timothygrass                 | 26(83.9)                  | 5(16.1)                                           | -                                                             | -                                                 | 31(100)         |
| Cultivated rye               | 22(71.0)                  | 6(19.4)                                           | 3(9.7)                                                        | -                                                 | 31(100)         |
| Alder                        | 31(100)                   | -                                                 | -                                                             | -                                                 | 31(100)         |
| Birch                        | 29(93.5)                  | 2(6.5)                                            | -                                                             | -                                                 | 31(100)         |
| Hazel                        | 27(87.1)                  | 3(9.7)                                            | -                                                             | 1(3.2)                                           | 31(100)         |
| Oak                          | 23(74.2)                  | 8(25.8)                                           | -                                                             | -                                                 | 31(100)         |
| Cypress                      | 20(64.5)                  | 9(29.0)                                           | 2(6.5)                                                        | -                                                 | 31(100)         |
| Common ragweed               | 27(87.1)                  | 4(12.9)                                           | -                                                             | -                                                 | 31(100)         |
| Mugwort                      | 24(77.4)                  | 5(16.1)                                           | 1(3.2)                                                        | 1(3.2)                                           | 31(100)         |
| English plantain             | 27(87.1)                  | 3(9.7)                                            | 1(3.2)                                                        | -                                                 | 31(100)         |

The highest food allergens in the studied subjects were potato (45.2%), apple (32.2%), probably due to the cross-reactivity of this substance with other allergenic substances, as and maybe because of the higher consumption of these foods by the people living in Birjand) and then, respectively, cow’s milk (29%) and soybeans and peanut (25.9%). Almond 22.6%, lactalbumin (22.6%, 22.6%, hazelnut 19.3%, rice 19.3%, egg yolk 16.1%, and wheat flour 13%). The frequency of food allergens and inhalers with age, sex and occupation did not have a significant relationship. However, the frequency of inhaler allergens had a significant relationship with education level (p=0.04). The frequency of respiratory and inhalation allergens in humans was significantly higher in contact with grass and weed. (P=0.001). However, no significant difference was observed in the sensitivity of allergy to food and inhalation according to the state of contact with dust, cockroaches, mites, fungi, contaminated air, pollen and pet. That is, those who had contact with the above did not generally have a higher frequency of food allergens or inhalants (Table 2).
**Table Continued...**

| Antibody/Allergy type | Frequency (%): No antibody | Frequency (%): Asymptomatic and weak antibodies (1) | Frequency (%): Weak antibody and symptomatic at high levels (2) | Frequency (%): Significant antibody and symptomatic | Total Frequency (%): | Frequency (Total) |
|-----------------------|-----------------------------|-----------------------------------------------|-------------------------------------------------|------------------------------------------|----------------|----------------|
| Cultivated rye       | 22(71.0)                    | 6(19.4)                                       | 3(9.7)                                         |                                            | 31(100)       |                 |
| Alder                 | 31(100)                     | -                                             | -                                              |                                            | 31(100)       |                 |
| Birch                 | 29(93.5)                    | 2(6.5)                                        | -                                              |                                            | 31(100)       |                 |
| Hazel                 | 27(87.1)                    | 3(9.7)                                        | -                                              | 1(3.2)                                    | 31(100)       |                 |
| Oak                   | 23(74.2)                    | 8(25.8)                                       | -                                              |                                            | 31(100)       |                 |
| Cypress               | 20(64.5)                    | 9(29.0)                                       | 2(6.5)                                        |                                            | 31(100)       |                 |
| Common ragweed        | 27(87.1)                    | 4(12.9)                                       | -                                              |                                            | 31(100)       |                 |
| Mugwort               | 24(77.4)                    | 5(16.1)                                       | 1(3.2)                                        | 1(3.2)                                    | 31(100)       |                 |
| English plantain      | 27(87.1)                    | 3(9.7)                                        | 1(3.2)                                        |                                            | 31(100)       |                 |

**Discussion and conclusion**

Identifying environmental allergens is a major challenge in allergic diseases that are essential for their prevention and treatment. So that the only way to cure these diseases is to avoid these substances. The aim of this study was to determine the prevalence of food allergy and inhalation using serum IgE level against allergens (RAST test). The search for the most common allergenic agents (Allergy) is the subject of many studies around the world. Investigations carried out at different points show a different pattern. In general, pollen is one of the main causes of allergic diseases. In Studies in Karaj, Isfahan and Zanjan, pollen has been reported as the most common allergy in allergic patients, including patients with urticaria and eczema. In a study in Khorasan in the age group of 7 to 12 years, the sensitivity to respiratory allergens was highest; So that the susceptibility to weed and pollen of the trees was highest. In a study in Tehran, among the common inhalable allergens tested in this study, pollen with the prevalence of 93.1% (228 cases) of the most common inhalant allergens Among pollens, weeds and bushes (autumn plants) have the highest positive skin test with a frequency of 214 (87.3%). In the present study, similar to these studies, the most susceptibility was to pollen of trees and weed was highest (35.5%).

The difference in pollen type and its abundance will be justifiable due to the different climatic and different genetics of these two regions. Various reviews show different patterns of allergens in different countries and even in different parts of a country. Vegetation alone is not a reason for higher sensitivity in patients and other conditions like warmer and especially dry air require more pollen of trees and grasses to play a greater role, as in Karaj, Tehran, Shiraz and foreign countries with such a climate has been observed. In Tehran, weeds are the most common cause of allergies. In the Americas and Western Europe, cypress are the most common among trees. In a study in Isfahan in patients with asthma and allergic rhinitis, 35% were allergic to pollen, and most of the grass was Timothygrass and rye. In this study, similar to Isfahan study, the pollen was the most common anesthetic allergen, which is justified by the similarity of the climatic conditions and the warm and dryness of these two regions. But among the grass and weeds, cultivated rye (29.1%) and sweet vernal grass (29.1%) were the most common and the Timothygrass was less (16.1%) than the study, but it was still common among Inhailant allergens. Because in spite of the similarity of the climate, the vegetation of these two regions has different .and the resulting frequency of grass and weeds will be different. In a study in Kuwait, weeds produced the highest inhalation allergens, Kenopodium 62% and Bermuda, 54% Similar to the present study, the grasses formed the most allergen after pollen.

In a study in Shiraz, 212 patients with sensitivity to allergen showed that sensitivity to pollens, mites, trees, and Passion grass (grass) is higher than other inhaler allergens. These results are very similar to those presented in warm and dry regions. Comparison between the results of various studies and the results of this study suggests that the incidence of each inhaler allergy in patients depends on the environmental conditions and The outbreak is allergen in the environment .Iran is a vast country with various climatic that are associated with different types of allergens and factors such as rainfall, humidity, wind speed and direction, temperature, amount of sun rays Affect the level of allergens. The warm weather at the start and severity of pollination of grasses, weeds and trees is effective.

In the present study, as well as a study in Isfahan and Shiraz maximum inhalation allergens is the pollen of trees (cypress), and then weeds and grass and cockroach are most. that way is the Cypress 35.5% Cultivated rye 29.1%, Sweatvernal grass 29.1%, cockroach 25.8%, oak 25.8%, Orchardgrass 22.6%, Mugwort 22.5% Timothygrass was 16.1% (reviewed grass and weed here includes Sweatvernal, Orchardgrass, Mugwort, and Timothygrass). Pollen is the main sources of allergen in Iran and the high proportion of these allergens with atopy suggests their role in the pathogenesis of allergic diseases in the region.

In the study of Pumhirun in Thailand, it was concluded that mites (Dermatophagoides pter in 79% and Dermatophagoides farina in 76% of patients)and cockroach were most inhaled allergens. Also, in the Ghaffari’s study, there was an increase in inhalation allergens of Dermatophagoides pter in 33%, Dermatophagoides farina In 32% of cases, and cockroach was positive in 22% of cases, but in the present study, contrary to the two studies mentioned, there was a small prevalence of Mite (9.7%), which is different due to different climatic conditions. Because Birjand is a region with tropics climate and The weather is warm and dry, and there is not enough moisture and therefore suitable conditions for the growth of Mite, but the cockroaches are similar to those of the two studies, and the percentage was almost the same with these studies, because today cockroach are found in most homes. (Of course, the regions with wet climates will certainly be more abundant).

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In another study in Mashhad, the prevalence of allergy to Dermatophagoides pter and Dermatophagoides farina was 20% and 17% respectively. In Karaj study respectively 19% and 18%, and in Tabriz 7.92% and 2.97%. As explained above, due to the higher moisture content of Mashhad and Karaj weather, compared to the dry and warm and dry areas of Birjand, the mites are more favorable condition for growth, hence, in these areas, the percentage is higher than the current study. They gave more and more. However, in the study of Tabriz, the percentage of the mite (Dermatophagoides pter) is somewhat similar to the current study, and the percentage of Farina Mite is less than the present study, which is why mites cannot survive in warm, dry and cold weather, and the moisture that is the main cause of their growth. There is no in Tabriz (cold air) and Birjand (hot and dry air).11

In a study in Tabriz, Cladosporium 4.4%, Penicillium 3.3%, Aspergillus 5.6%, Alternaria 13.3%,7 all of which had different percentages in the study. In the Gonabad study, the highest percentage of fungi isolated were yeast (31%), cladosporium (30%), penicillium (19.5%), aspergillus (6.3%), alternaria (3.6%), except for alternaria, which was almost the same percentage as the study, the other fungi were completely different from the study. In the present study, due to the dry weather of Birjand, the fungi received a small percentage. In Gonabad, due to the relatively wetter air relative to Birjand, environmental conditions such as oxygen, moisture and food sources are more likely to grow in fungi, so they can grow and grow more and more. In a study in Semnan, the prevalence of allergy to Aspergillus was 12.3%, Cladosporium 11%, Alternaria 10.7%, Penicillium 8.3%. In the present study, cladosporium was 12.9%, 6.5% penicillium, 3.2% alternaria and 0%aspergillus. Which had only the same percentage of cladosporium and penicillium? Growth of fungi occurs in areas of shadow and moisture, and on rotting leaves and rubbish. Wind and rain and temperature are effective in the distribution of fungal spores. Therefore, climatic conditions (wind and rain and different heat levels) differently cause this difference in the frequency of fungi in these areas, because the two regions are dry and the climate and geography are similar, the results are somewhat the same. There are no severe winds and no storms. Therefore, due to the differences in the conditions for the transfer of spores and the type of vegetation, there is little difference that the percentage of different aspergillus and Alternaria is an example of this. Of course, in a study in Khorasan, such as our findings, there was no case of susceptibility to a spergillus.

In Hoffman study et al., The most common allergens were grass, mite, and house dust.14 However, in the present study grass and weed was the most allergen after pollen, but house dust and mite Contrary to the previous study, there was not much percentage because of low moisture content in the city of Birjand.15

In Hoffman study et al. .84% had specific IgE antibodies against Cultivated rye.15 In the present study, cultivated rye was reported to be 29.1%, due to the difference in geographical location of the transplant conditions and Genetics as well as vegetation differences in these two regions. In a study by Yang WP, the most common allergens in weed were chenopodium (61.6%) and mugwort (44.1%).16 In the present study, mugwort (22.5%) had a lower prevalence and chenopodium has not 1% investigated. It is also justified by the difference in vegetation and climate in these two regions. The prevalence of food allergens in this study was 45.2% potato and 32.2% apple (which is probably due to cross-reactions with other allergens). Cow’s milk (29%), soybean 25.9%, Peanut (22.6%), lactalbumin (22.6%), egg yolk 16.1% and wheat flour 13%), and the difference in the frequency of allergens is different according to the habits and diet and culture of each region. In a study by Karalei and Sicherer in New York, common allergens included eggs, milk, wheat, peanuts and soy.29,30 In addition, another study in the Tehran Clinical Center for Asthma and Allergy and on 313 children aged 4 months to 16 years was the most common food allergy based on the skin prick test, cow’s milk and eggs, which is almost consistent with the common allergen group in this study.

In a study in Tabriz, the most susceptible to potato allergens (11.3%) was similar to the study by Worn in Germany and the present study, which can be attributed to the increased consumption of potatoes in both areas and more allergen to potatoes. In the adult group,73 In Semnan study on 206 children under the age of 16 years, 35% had at least one food (wheat, rice, peanut, egg, soy, or milk), and the most common food allergies were peanut and soybeans respectively.73 Similar to the study, soybean and peanut were one of the most abundant food allergens. Differences in dietary habits in different countries and even different age groups of the subjects will have an important role in distributing the frequency of allergens. Another important factor is the racial and ethnic differences. There is a widespread variation in the pattern of allergies among different countries, and this difference in food allergens is higher than inhaler allergens.39

In the present study, the distribution of food and inhalation allergens in both sexes was the same. There was no significant difference between men and women.20-30,40,41 There was no significant difference in age between food allergens and inhalants, which was similar to some studies.20,35 Mite allergies in farmers were significantly higher than common allergens such as pollen and animals.42 In the Gotland study by Iversen, from 144 farmers, 17% of mite allergens was found and confirmed the result of the previous study.43 Therefore, in contrast to the expectations of public opinion, there is no significant increase in pollen and animals allergen. In the present study, there was no significant relationship between occupation and common allergens, and that it might was higher in Gutland than in the present study, but this is not high in the present study. This is probably due to the low amount of mites and the lack of favorable conditions for growth in the region with dry and humid weather. This is opposed to other studies.44-46 In a study in Kashan, on workers at the textile factory, respiratory allergy was higher in those who had more exposure to wool and cotton fibers. This is opposed to the study of course, in the jobs of this study; there was no textile or worker who has been in contact with wool and cotton. But jobs such as building and construction workers who are more exposed to dust However, there was no significant relationship between the frequency of inhaler allergens and their occupations, and they were not related to other occupations, which may be due to different testing methods (RAST or Prick test) or even cases such as masking in patients Review in this study. In a study conducted by Khazaee’i, there was a significant relationship between the presence of allergic rhinitis and occupation (student, teacher, and housekeeping), which could have a role in the limited physical space and contact with house dust as well as exposure. Determine the use of detergents, especially in housewives, in the Incidence of allergic diseases, which contradicts our finding that there is no relation between occupation and the frequency of allergens is.29,45

In our study, those who had a history of contact with weeds and grasses had a higher prevalence of food allergens (P=0.02) and inhalation allergen (P=0.001). In a study in Ahvaz, the prevalence

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of allergen in the home. Significantly, in women higher than men, and the incidence of out-of-home allergens in males was somewhat higher than that of women (given that men spend more time outdoors than women, they are more exposed to allergens Out of the house; and conversely, more women at home may have more contact with allergens in the home and increase their sensitivity. But this difference was not statistically significant.52 This is contrary to our finding that there is a meaningful relationship between allergen exposure and allergen exposure. In a study by Siroux, there is a correlation between contact with grass allergens and the frequency of IgE (the frequency of allergens based on IgE level). In this region, since contact with the Timothygrass is high, the specificity of its IgE is high, which confirms the findings of the present study, so that those who have contact with grass allergen were also more likely to have allergies in them.46 In the farrokhi study, the most frequent allergic rhinitis symptoms were reported in spring and winter, and the reason for this was the pollination of trees in the spring.53 These studies had confirmed our founds to have a meaningful relationship between contact allergen (Grass and weed and frequency of the allergens.) In this study, there was a significant relationship between education level and allergy (p=0.04). As the study in Birjand showed that the risk of dermatitis was lower in children with mothers who had a high school diploma or higher than their children with low diploma education mothers.58 while in the same study, there was no relationship between maternal education and the prevalence of atopic dermatitis.46

Due to the low number of samples, it is suggested that higher sample sizes be used in subsequent studies and other allergies that were not evaluated in this study. It is also suggested that comparative populations be used in comparable provinces in the same climatic conditions.

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Conflict of interest
The author declares there is no that conflict of interest.

References

1. Lok SD, Davis BE, Cockcroft DW. Prevalence of allergen sensitization in 1000 adults in Saskatchewan. Allergy, Asthma & Clinical Immunology. 2017;13(1):1–9.
2. Morris MJ, Argyros Col GJ, Batuello SG, et al. Asthma. Medscape. 2017.
3. Ghaffari J, Rafatpanah H, Khalilian AR, et al. Skin Prick Test In Asthmatic, Allergic Rhinitis And Urticaria Patients. Med J Mashhad Univ Med Sci. 2011;54(1):44–49.
4. Joyce Irene Boye. Food allergies in developing and emerging economies: need for comprehensive data on prevalence rates. Clinical and Translational Allergy. 2012;2:25.
5. Turnbull JL, Adams HN, Gorard DA. The diagnosis and management of food allergy and food intolerances. Aliment Pharmacol Ther. 2015;41(1):3–25.
6. Burks AW, Tang M, Sicherer S, et al. ICON: food allergy. J Allergy Clin Immunol. 2012;129(4):906–920.
7. Kim HY, Shin YH, Han MY. Determinants of sensitization to allergen in infants and young children. Korean J Pediatr. 2014;57(5):205–210.
8. Custovic A, Sonntag HJ, Buchan IE, et al. Evolution pathways of IgE responses to grass and mite allergens throughout childhood. J Allergy Clin Immunol. 2015;136(6):1645–1652.
9. Akbary H, Rezaei A. Skin test assay in allergic patients of Esfahan city. Research Med Sci. 2017;19(6):962–971.
10. Moradi A, Shirkani A, Tahmassebi R, et al. Association between Aeroallergens and Allergic Diseases Based on Skin Prick Test in Bushehr Province. ISMJ. 2017;19(6):962–971.
11. Hoffman DR, Yamamoto FY, Geller B, et al. Specific IgE antibodies in atopic eczema. Journal of Allergy and Clinical Immunology. 1975;55(4):256–267.
12. Ondemir Ö, Elmas B. New Developments in the Diagnosis and Therapy of Allergic Rhinitis. Asthma Allergy Immunology. 2017;15(1):1–7.
13. Mohammad HR, Belgrave D, Kopec Harding K, et al. Age, sex, and the frequency of allergen exposure among New Orleans children with asthma. Pediatr Allergy and Immunol. 2016;27(3):313–319.
14. Milgrom H, Leung DYM. Allergic rhinitis. In: Kligman RM, Stanton BF, St. Geme J, Schor N, Behrman RE, editors. Nelson Textbook of Pediatrics. 19th edition. Philadelphia: Saunders Elsevier; 2011. 775–780 p.
15. Syibalski AJ, Zalewska M, Furmanczyk K, et al. The prevalence of sensitization to inhalant allergens in children with atopic dermatitis. Allergy Asthma Proc. 2015;36(5):e81–e85.
16. Golkari H, Ghaderi reza. Epidemiologic study of asthma, rhinitis and eczema in children aged 7-6 years old and 14-12 years old in Birjand city in 1996. Iran: Birjand University of Medical Sciences and Health Services.
17. Akbary H, Rezaei A. Skin test assay in allergic patients of Esfahan city. Research Med Sci. 2017;19(6):962–971.
18. Fouadseresht H, Safari S, Moqaddasi M, et al. Prevalence of food and airborne allergens in allergic patients in Kerman. J Kermanshah Univ Med Sci. 2014;18(4):234–241.
19. Rabito FA, Iqbal S, Holt E, et al. Prevalence of indoor allergen exposures among New Orleans children with asthma. J Urban Health. 2007;84(6):782–92.
20. Ahmadiasfar A, Sepahi S, Moosavinasab S, et al. Recognition and frequency determination of common allergens in allergic patients of Zanjan city by skin prick test. J Zanjan Univ Med Sci. 2008;16(64):47–56.
21. Farid R, Bahrami A, Ghorashi-al Hosseini J. Aeroallergens in northeastern Iran (Khorasan). Ann Allergy. 1991;66(3):235–236.
22. Ahanchean H, Jafari S, Azad FJ, et al. Evaluation of common allergens in children with atop eczema by skin prick test. J Khorrassan. 2011;66(3):235–236.
23. Arshi S, Zarrinford R, Fereidinnejad SM, et al. Determination of the Prevalence of Allergy to Autumn Pollens in Allergic Rhinitis Patients. Allergol Immunol. 2013;5(3):551–555.
24. Hosseini S, Shoormasti RS, Akramian R, et al. Skin prick test reactivity to common Aero and food allergens among children with allergy. Iranian journal of medical sciences. 2014;39(1):29–35.
25. Solomon WR, Platts M. Aerobiology of allergens. In: Middleton EJR, Ellise EF, Yunginger JW, et al. principle and practice of allergy. 4th edition. USA: Mosby Co; 1993. 469–526 p.
26. Goronfolah L. Aeroallergens, atopy and allergic rhinitis in the Middle East. Eur ann of allergy and Clin Immunol. 2016;48(1):5–21.

27. Williams HC. Epidemiology of atopic dermatitis. Clin Exp Dermatol. 2000;25(7):522–529.

28. Bener A, Safa W, Abdalhalik S, et al. An analysis of skin prick test reactions in asthmatics in a hot climate and desert environment. Allerg Immunol. 2002;34(8):281–286.

29. Khazaei HA, Hashemi SR, Aghamohammadi A, et al. The study of type I allergy prevalence among people of south-east of Iran by skin prick test using common allergens. Iran J Allergy Asthma Immunol. 2003;2(3):165–168.

30. Pumhirun P, Toviwat P, Mahakit P. Aeroallergen sensitivity of Thai patients with atopic rhinitis. Asian Pacific journal of allergy and immunology. 1997;15(4):183–185.

31. Ghaffari J. Prevalence of aeroallergens in skin test of asthma, allergic rhinitis, eczema and chronic urticaria patients in Iran. Journal of Mazandaran University of Medical Sciences. 2012;22(87):139–151.

32. Zandkarimi MR, Hosseini RF, Jabbari F, et al. Evaluation of effectiveness of specific subcutaneous immunotherapy for patients with allergic rhinitis and asthma. Iranian south Medical Journal. 2013;16(2):110–117.

33. Samnochcki Z, Dejewska J. A comparison of criteria for diagnosis of atopic dermatitis in children. World J Pediatr. 2012;8(4):355–358.

34. Moore MM, Rifas shiman SL, Rich Edwards JW, et al. Perinatal predictors of atopic dermatitis occurring in the first six months of life. Pediatrics. 2004;113(3 pt 1):468–474.

35. Keshvari S, Shirkani A, Tahmasebi R, et al. Association between Allergic Diseases and Food Allergens Based on Skin Prick Test in Bushehr Province. ISMJ. 2017;20(2):46–56.

36. Yu W. The role of food allergy in atopidermatitis in children. Hong Kong Dermatol Venereol Bullet. 2001;9(3):110–116.

37. Bonyadi MR, Ezzati F. Common Allergens in Patients with Atopic Dermatitis. Medical Laboratory Journal. 2014;8(2):67–75.

38. Salehi T, Pourpak Z, Karkon S, et al. The study of egg allergy in children with atopic dermatitis. World Allergy Organ J. 2009;2(7):123–127.

39. Borkowski TA, Eigemmann PA, Sicherer SH, et al. Frequency of IgE-mediated food allergy among children with atopic dermatitis. Pediatrics. 1998;101(3):E8.

40. Hage Hamsten Ma, Johansson SG, Zetterström O. Predominance of mite allergy over allergy to pollens and animal danders in a farming population. Clinical & Experimental Allergy. 1987;17(5):417–423.

41. Shakurnia AH, Assarehzadeghan MA, Mozaffari A, et al. Prevalence of aeroallergens in allergic patients in Ahvaz. Jundishapur Sci Med J. 2013;12(82):81–90.

42. Pazoki N, Ahmadi A, Mansori M, et al. Prevalence of Aeroallergens in Patients with Allergic Rhinitis. Journal of Mazandaran University of Medical Sciences. 2015;25(125):73–80.

43. Nabavi M, Ghorbani R, Bemanian MH, et al. Prevalence of mold allergy in patients with allergic rhinitis referred to Semnan clinic of allergy. Koomesh. 2009;11(1):27–32.

44. Sicherer SH, Morrow EH, Sampson HA. Dose-response in double-blind, placebo controlled oral food challenges in children with atopic dermatitis. J Allergy Clin Immunol. 2000;105(3):582–586.

45. Iversen M, Korsgaard J, Hallas T, et al. Mite allergy and exposure to storage mites and house dust mites in farmers. Clin Exp Allergy. 1990;20(2):211–219.

46. Siroux V, Lupinek C, Resch Y, et al. Specific IgE and IgG measured by the MeDALL allergen-chip depend on allergen and route of exposure: The EGEA study. J Allergy and Clin Immunol. 2017;139(2):643–654.

47. Ghaderi R, Tabiei S, Peyrovi S, et al. Prevalence of atopic dermatitis and its risk factors in 2-5 years old children at kindergartens of Birjand city (2008). Journal of Birjand University of Medical Sciences. 2012;19(3):286–293.

48. Khazaei H, Shirzad HA, Zamanzad B. Study Of Serum Ige And Nasal Secretion Eosinophils Count In Patients With Allergic Rhinitis. Journal Of Medical Council Of Iran. 2006;24(2):113–118.

49. Ghaderi R, Tabiei S, Peyrovi S, et al. Prevalence of atopic dermatitis and its risk factors in 2-5 years old children at kindergartens of Birjand city (2008). Journal of Birjand University of Medical Sciences. 2012;19(3):286–293.

50. Khosravi AR, Haghhighi M, Bahonar A. The study of air flora of Gonabad city for allergenic fungi in summer and in spring. The Horizon of Medical Sciences. 2006;12(3):10–16.

51. Farrokhii S, Gheybi R, Movahhed A, et al. Prevalence and risk factors of asthma and allergic diseases in primary schoolchildren living in Bushehr, Iran: phase I, III ISAAC protocol. Iran J Allergy, Asthma and Immunology. 2014;13(5):348–355.