RESEARCH ARTICLE

Incidence of food and aero allergies among patients visiting Allergy center National Institute of Health (NIH), Islamabad

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Abstract

Objective: To identify the most common allergy type among patients visiting an urban allergy centre.

Methods: The descriptive cross-sectional study was conducted at the Allergy Centre of the National Institute of Health, Islamabad, Pakistan, from December 2019 to June 2020, and comprised subjects of either gender aged 20-50 years. Skin prick test was used to determine the skin reactivity for 11 common allergen extracts. Patients with a wheal diameter >3mm were considered positive. Data was analysed using SPSS 22.

Results: Of the 100 patients, 55(55%) were males and 45(45%) were females. The overall mean age was 34.03±8.16 years. Majority of the respondents 93(93%) were sensitive to aeroallergen, 7(7%) to food allergens, and 2(2%) exhibited sensitivity against both types of allergens. Poly-sensitisation was found among 86(86%) respondents.

Conclusion: Aeroallergens were found to be the main triggering factor for allergies compared to the food allergens.

Keywords: Food allergies, Aero allergies, Skin prick test, Pollen. (JPMA 72: 654; 2022)

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Introduction

Worldwide, allergy is becoming a disease of considerable importance accounting for a huge disease burden. Being a very common disease, it affects more than 20% of the population of highly developed countries. Allergy is, by definition, an immune-mediated hypersensitivity reaction which involves specified recognition of a certain allergen and the production of particular immunoglobulins, usually the isotype immunoglobulin E (IgE). This follows with symptoms that include allergic rhinitis, itching, redness in eyes, eczema, hives or it might even include an asthmatic attack. The response of the immune system to harmless stimuli in the environment is through the production of IgE by basophils and mast cells. Allergy is classified as type I amongst the four types of hypersensitivities.[1-4]

Along with genetic factors, a myriad of environmental, behavioural and cultural factors influence the frequency, severity and the type of allergic exposition in patients. This is evident from research that many patients are sensitive to more than one allergen. In the subcontinent, the source of majority of the allergens are pollen grains, foods, insects, fungal spores and dust mites.[5-7]

Food allergy has been progressively acknowledged as a growing public health concern, and this has been alluded to as the "second wave" of allergy epidemic after asthma.[8] Millions of people are being affected by food allergy, as this is responsible for a considerable morbidity and impaired quality of life along with the costs to individuals, families and societies. It frequently sets off anaphylaxis in the community which can be lethal. Allergy might develop due to any food, but mostly is triggered by hen's egg, wheat, nuts, sea food, cow's milk, fish and peanuts etc. Although respiratory allergies, specifically allergic rhinitis, are most frequently present in varying populations globally and it is expected that the incidence might increase with time.[9-13]

Pollens, amongst the various types of allergens, play a vital role in allergies and are regarded as the major component of aeroallergens that result in allergic rhinitis and asthma.[1,14] It is estimated that out of those suffering from allergy, 40% have been affected by pollens.

The sensitisation to aeroallergens varies in different countries and regions and the underlying causative factor in pathogenesis of the respiratory allergic disorder is the presence of aeroallergens.[15,16]

Research depicts that Pakistan ranks 4th amongst the countries which produce raw cotton (RC), and, consequently, the general public, specifically the countrymen and farmers, who, when exposed to dust and other particulate matter produced as a result of crop cutting and vegetation, are at higher risk of developing allergic reactions. Likewise, in the capital city of Pakistan, paper mulberry (PM) is one of the commonest sources of allergic pollens and this further aggravates the situation because of the rapid growth and its extensive dispersal

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due to shallow root system.[6,17]

For efficient diagnosis of allergy and pertinent treatment, there is a need to identify the causative allergens, inducing clinical symptoms. The current study was planned to identify the most common food and aeroallergies among patients visiting an urban allergy centre.

Subjects and Methods

The descriptive cross-sectional study was conducted at the Allergy Centre of the National Institute of Health (NIH), Islamabad, Pakistan, from December 2019 to June 2020. After taking approval from the institutional ethics review committee, the sample was raised using non-probability convenience sampling technique. The sample size was calculated using online Raosoft calculator at 95% confidence level.[18] Those included were individuals of either gender aged 20-50 years with positive response to skin prick test (SPT).[19] Those who showed desensitisation to SPT or had any other disease which correlated with the symptoms of allergies were excluded. Patients with history of drugs affecting SPT results were also excluded.

After taking informed consent from each patient, data was collected prospectively on a pre-designed proforma. SPT was carried out to determine the target antigen of the IgE-mediated allergic reaction. Aero-allergens included were mixed pollens of local allergenic plants), dust, PM, threshing dust (Th) and RC. Beef, meat, chicken, egg, fish and rice allergens were used to test food allergy. Detailed history about age, gender, residence, information regarding the medication used, family history of allergy and recommendation was also noted.

SPT was performed by trained technicians under physician supervision as per institutional protocols. The allergen extracts and negative controls were put on the patients' inner forearms and irritation of the epidermis was caused by prick method using the lancet. The result was observed after 15 minutes. Next, the diameter of patient's skin reaction was measured and was compared with the negative control. Patients with a wheal diameter >3mm were considered positive.[20]

Data was analysed using SPSS 22. Frequencies and percentages were calculated for qualitative variables.

Results

Of the 100 patients, 55(55%) were males and 45(45%) were females. The overall mean age was 34.03±8.16 years. Majority of the respondents 93(93%) were sensitive to aeroallergen, 7(7%) to food allergens, and 2(2%) exhibited sensitivity against both types of allergens. Poly-sensitisation was found in 86(86%) subjects. The prevalence rate for allergen groups was: beef 7(7%), meat 8(8%) chicken 4(4%), egg 2(2%) fish 1(1%), Rice 1(1%), pollen 65(65%), dust 70(70%), PM 42(42%), Th 39(39%) and RC 28(28%) (Table).

Table: Frequency of food and aeroallergens.

Allergen types	Frequency of negative SPT	Frequency of positive SPT	Total
Beef	93 (93%)	7 (7%)	100
Meat	92 (92%)	8 (8%)	100
Chicken	96 (96%)	4 (4%)	100
Egg	98 (98%)	2 (2%)	100
Fish	99 (99%)	1 (1%)	100
Rice	99 (99%)	1 (1%)	100
Pollen	35 (35%)	65 (65%)	100
Dust	30 (30%)	70 (70%)	100
Paper mulberry (PM)	58 (58%)	42 (42%)	100
Thresher dust (TH)	61 (61%)	39 (39%)	100
Raw cotton (RC)	72 (72%)	28 (28%)	100

SPT: Skin prick test.

Age-wise distribution showed 39(39%) subjects in the 36-43 years age group, followed by 28(28%) aged 20-27 years, 22(22%) aged 28-35 years and 11(11%) aged 44-51 years (Figure-1).

Area-wise distribution showed that 34(34%) cases hailed from Punjab, and 26(26%) from Khyber Pakhtunkhwa (KP). The patients exhibiting food allergen sensitisation were mostly from KP 6(66.6%), followed by the twin cities of Rawalpindi and Islamabad 2(22.2%) and 1(11.1%) was from Punjab.

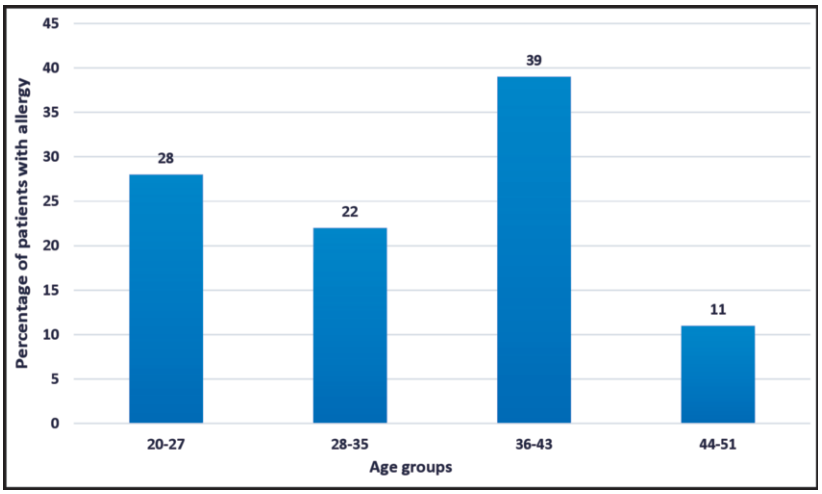

Figure-1: Age-wise distribution of allergies.

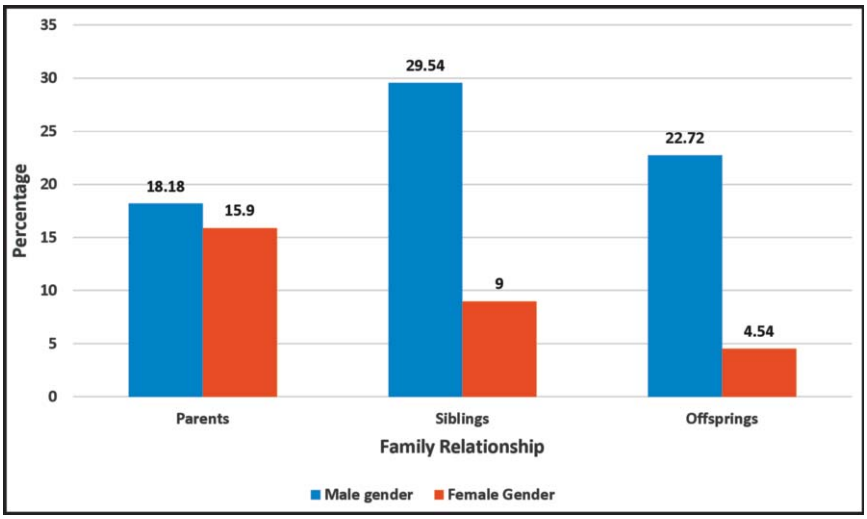

Figure-2: Family history of allergies.

Also, 44(44%) patients had family history of allergies (Figure-2).

The majority was taking medication previously 82(82%). Only 12(12%) patients had used the flu vaccination. When asked about visit to the allergy centre, 41(41%) patients responded that they had come for allergy testing on doctor's recommendation, followed by those who were aware and visiting out of personal choice 31(31%), and 28(28%) were visiting on some relative's advice.

Discussion

With the increase in pollution, there is likely to be an increase in the incidence of aero-allergies. In the current study, patients visiting the NIH allergy centre displayed a higher incidence of sensitisation to aero-allergens compared to food allergens. This is similar to earlier epidemiological studies.[6,21] The number of patients with positive skin prick reaction to dust, pollen and PM allergens was high compared to Th and RC. Positive reaction to food allergen was low 9(9%). A study conducted in Pakistan reported similar findings.[6] However, in contrast to previous study dust allergen exhibited maximum number of sensitisation instead of the pollen allergen.[6] Aero-allergen sensitisation pattern among the patients suggested poor indoor and outdoor air quality in Pakistan because of house dust, pollens and agricultural dust, like Th and RC. Due to the lack of awareness and poor socio-economic lifestyle, the frequency of allergen sensitisation caused by house dust was relatively high. These results are not surprising, as multiple studies found aero-allergens to be the main causative factor of allergies.[6,21,22] Previous research also reveals that ongoing climate change is aggravating the impact of aero-allergens on allergic diseases in humans. Elevated atmospheric carbon dioxide (CO_2) concentration along with temperature rise owing to global warming has a fertilising effect on plant growth, resulting in increased pollen production as well as pollen grain allergen content. Furthermore, the rise in temperature is also altering the duration and timing of the pollen season.[23] Climate change also influences the concentration of airborne pollutants which, in conjunction with aeroallergens, is contributing to increased incidence of aeroallergies and other respiratory disorders.[24]

Findings of the current study indicated that family history of allergy was one of the most predisposing factors in the development of allergen sensitisations among males. This is concurrent with the results of another study.[21] Genetic factors along with environmental factors lead to atopy.[25]

The present study found a higher percentage of allergen sensitization among males than in females. Commonly, males showed family history of allergies. The increase in the number of male patients could be due to prolonged exposure to outdoor environmental triggers, like pollen, Th and RC. Overcrowding and pollution seem to be additional causative factors for allergies. Moreover, the male population in Pakistan has easy access to medical centres and clinics compared to the females which may be an important factor in higher male cases observed in the study. Findings of another study were in harmony with the present study.[6]

Age distribution depicted that individuals aged 36-43 years and those aged 20-27 years were more susceptible to allergies compared to any other age group. Another study also found relatively the same groups, 31-40 years followed by 21-30 years.[21]

The most affected geographical localities for the incidence of allergies in the current study were Punjab, KP and the twin cities of Rawalpindi and Islamabad, which was in line with earlier findings.[6,21]

Further studies should be conducted to uncover the common allergens and their association with particular allergic diseases in Pakistan. As the incidence of food allergies was found to be low, there is a need for large-scale studies to assess the exact prevalence of food allergies.

Conclusion

Aeroallergens were found to be the main triggering factor

for allergies compared to the food allergens. Poly-sensitisation was common, and Punjabi males aged 36-43 years were the most at risk of allergies.

Disclaimer: The text is based on an academic thesis for the completion of BS Medical Laboratory Technology degree.

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