Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.69980/bht6gs37

"SENSITIZATION TO INHALANT AND FOOD ALLERGENS IN ATOPIC PEOPLE LIVING IN AND AROUND KANPUR BY IN VITRO SPECIFIC IgE ASSAY IN ATOPIC PATIENTS ATTENDING A TERTIARY CARE HOSPITAL IN KANPUR"

Priyanshi[1*] , Pragya Pandey[2], Kamini Savita Sr[3] , Praveen Kumar[4]

[1*]Tutor Department of Microbiology Uma Nath Singh Autonomous State Medical College, Jaunpur
[2]Tutor Department of Microbiology Shri Gorakshnath Medical College Hospital and Research Centre Gorakhpur
[3]Department of Biochemistry of Sarojini Naidu Medical College, Agra

***corresponding author;**Priyanshi
priyanshi3570@gmail.com

ABSTRACT

INTRODUCTION: - Allergy is a conditionin which immune system produce a response against antigens also known as allergens that results in excessive or exaggerated reactions leading to tissue damage, disease or even death. It is initiated after the first contact with an antigen (e.g. usually harmless microbes, allergens, or self-antigens) which sensitize the immune system after the second contact leading to overwhelming, uncontrolled strong immunological and pathophys iological reactions.

AIM: - To find out the prevalence of inhalant and food allergies in and around Kanpur, UP.

MATERIAL AND METHOD: - Peripheral blood samples were collected from 250 atopic patients for IgE serum levels specific to inhalant allergens and food allergens. Specific IgE serum levels were assayed by RAST, Phadiatop-250. Specific IgE levels (RAST) greater than or equal to 0.35 UI/ml were defined as positive.

RESULTS: - Specific IgE serum levels were observed among atopics cases. The frequency of main inhalant allergens was: *Dermatophagoides Pteronyssinus* = 49.2%, Timothy grass = 43.2%, Cotton = 36.4%, Bermuda grass = 32.8. In relation to food allergens, we observed: Banana = 71.2%, Lemon = 40%, Carrot = 37.6%, Milk = 34.4%. With respect of age, food allergen sensitization predominates in young children whereas the inverse occurs with inhalant allergens.

CONCLUSION: - There was a predominant frequency of sensitization to inhalant allergens, mainly house dust mites in the evaluated patient groups. Food allergens were also responsible for a significant proportion of sensitization mainly banana.

KEYWORDS: - Allergen, Sensitize, RAST

INTRODUCTION

The prevalence of allergic disease has been rising dramatically in the past several decades, adding a new burden to global public health. Over 20% of the world population suffers from IgE mediated allergic diseases [1].

In India alone approximately 20-30% of total population suffers from at least one or more of the allergic diseases [2]. Prevalenceof atopy worldwide is about 45-79% and that of atopic asthma varies from 25% to 63% [3]. In India, the prevalence of asthma is estimated to range from 3% to 38% in children and from 2% to 12% in adults [4,5]. AR is considered to be a trivial disease in India; although, the symptoms of rhinitis were present in 75% and 80% of asthmatic children and adults, respectively [6].Allergic testing can be done by skin testing (by SPT, intradermal testing and patch test) or by blood investigations for allergy (by detecting free antigen – specific IgE) e.g. Enzyme Linked Immunosorbent assays (ELISAs), Radioallergosorbent assays (RASTs), Immunecapture assay (ImunCAP), Fluorescent Enzyme Immunoassays (FEIAs)[7] Tests performed in vitro attempt to identify specific IgE in patient's serum. Total serum Ig levels are most useful in screening for atopic predisposition, rather than in the diagnosis or management of atopic diseases[8-10] Food allergy is a malfunction of the immune system in response to dietary antigens [11]. In children approximately 90% of hypersensitivity reactions are caused by milk, eggs, peanuts, soybeans and wheat, whereas, in adults, fish, shellfish, tree nuts and peanuts account for approximately 85% of allergy [12].
Common inhalant allergens are pollens of grasses, trees and weeds; fungi; animal allergens and dust mites [13].

MATERIAL AND METHODS STUDY SETTING-

This retrospective observational study was conducted in the Department of Microbiology at Rama Medical College Hospital and Research Centre Kanpur, Uttar Pradesh, India from January 2020 to December 2020.

SAMPLE SIZE-

250 samples were taken.

SAMPLECOLLECTIONAND METHODS-

250 peripheral blood samples were taken from allergic patients so that IgE serum levels specific to inhalant allergens (*Dermatophagoides pteronyssinus, Dermatophagoides farinae*, cat dander, dog dander, moulds, grasses etc.) and food allergens (milk, egg yolk, peanut, wheat and fish etc) and total IgE serum levels (RAST, Phadia 250) could be assayed. The Specific IgE levels (RAST) greater than or equal to
0.35 UI/ml were defined as positive. Inclusion criteria-

1. Atopic patients were taken.
2. Patients in age range of 1-60 years. Exclusion criteria-

1. Non-atopic individuals.
2. Systemic steroid therapy in last 4 weeks.

RESULTS

In this study the distribution of gender as shown in [Fig no. 1]. Specific IgE serum levels were observed among atopic cases. The frequency of main inhalant allergens was [Graph No. 1]: *Dermatophagoides Pteronyssinus* = 49.2%, Timothy grass = 43.2%, Cotton = 36.4%, Bermuda grass =
32.8. In relation to food allergens, we observed [Graph No. 2]: Banana = 71.2%, Lemon = 40%, Carrot = 37.6%, Milk = 34.4%. With respect of age, food allergen sensitization predominates in young children whereas the inverse occurs with inhalant allergens.

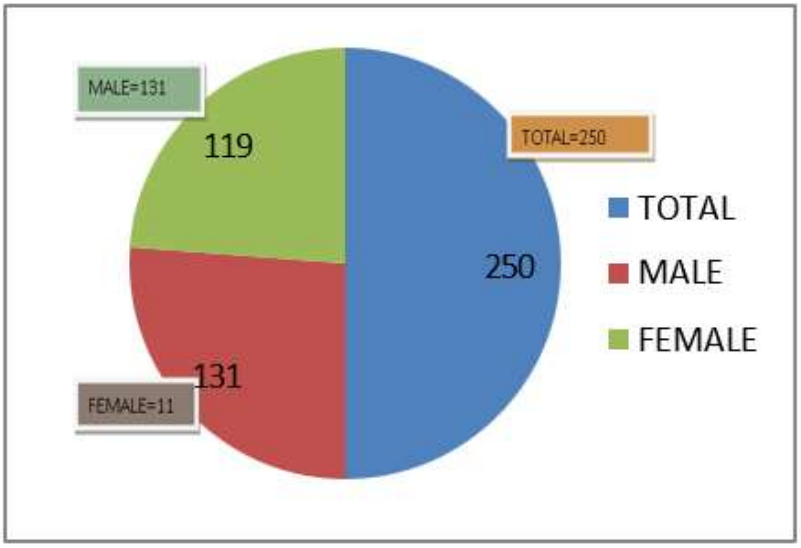
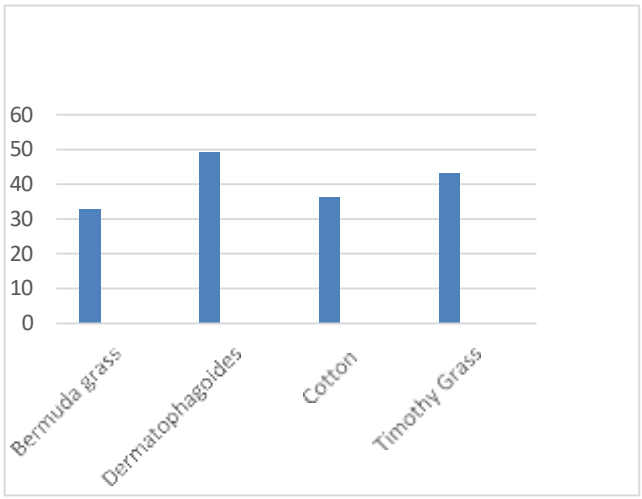
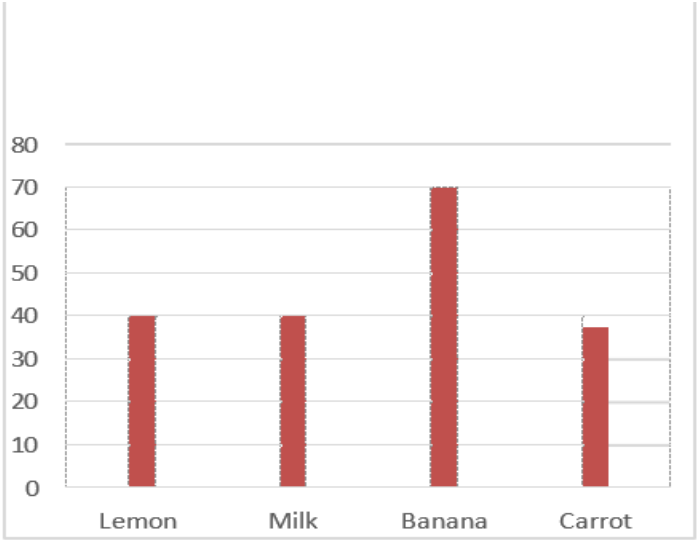


Fig No. 1- Gender wise distribution of cases



Graph No. 1- Frequency of main inhalant allergens



Graph No. 2- Frequency of main food allergens

DISCUSSION

Sensitization to allergens has been recognised as the most important risk factor for atopic diseases.

In our study we found out that there were no differences in accordance to the gender which was similar to the study conducted by Naspitz C et al. in 2004 [13]. Total IgE serum levels were observed among atopics. The frequency of main inhalant allergens was: Dermatophagoides Pteronyssinus = 49.2%, which was similar to the study by Naspitz Cet al. where *D. Pteronyssinus* was 66.7%, Timothy grass = 43.2%, Cotton 36.4%, Bermuda grass = 32.8. In relation to the food allergens, we observed that with Banana = 71.2%, Lemon = 40%, Carrot = 37.6%, Milk
= 34.4% which correlates with the study [13] where it was 23.1% With respect of age, food allergen sensitization predominates in young children whereas the inverse occurs with inhalant allergens [13].

CONCLUSION

In conclusion, sensitization to food is mostly common in early life, in parallel with the rising prevalence of sensitization to inhalant allergens at older age. Serum total IgE levels appear to be associated with the response to different types of allergens. Sensitization to food, especially banana followed by lemon and milk is highly related to eczema, whereas sensitization to inhalant allergens appears to be more specific to the development of rhinitis and asthma. A combined sensitization to food and inhalant allergens not only has an additive effect on serum IgE antibody production but also increases the risk of developing atopic diseases. A fully understanding of the prevalence of allergen sensitization in different age would help early diagnosis and diagnosis and intervention of atopic diseases in early childhood..

REFRENCES

1. Johansson SGO, Haahtela T. World Allergy Organization Guidelines for Prevention of Allergy and Allergic Asthma. World allergy organization guidelines. Available from: http://www.worldallergy.org/WAD2005/ index.html;2008;401-414.
2. Prasad R, Kumar R. Allergy situation in India: What is being done? Indian J Chest Dis Allied Sci.2013;55(1):7-8.
3. Eder W, Ege MJ, von Mutius E. The asthma epidemic. N Engl J Med.2006;355(21):2226-35.
4. Kant S. Socio-economic dynamics of asthma. Indian J Med Res. 2013; 138:446-8.
5. Worldwide variation in prevalence of symptoms of asthma, allergic rhino-conjunctivitis, and atopic eczema: ISSAC. The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Lancet. 1998;351(9111):1225-32.
6. Shah A, Pawankar R. Allergic rhinitis and co-morbid asthma: Perspective from India -- ARIA Asia-Pacific Workshop report. Asian Pac J Allergy Immunol. 2009; 27:71-7.
7. Satwani H, Rehman A, Ashraf S et al; Is serum total IgE levels a good predictor of allergies in children? Pak Med Assoc;2009; Vol.59:698-702.
8. Sunyer J, Anto JM, Castellsague J, Soriano JB, Roca J Total Serum IgE is associated with asthma independently of specific IgE levels. The Spanish Groupof the European Study of Asthma; Eur Respir J;1996; Vol.9:1880–1884.
9. Burrows B, Martinez FD, Halonen M et al; Association of asthma with serum IgE levels and skin-test reactivity to allergens. N Engl J Med;1989; Vol.320: 271–277
10. Ballmer-Weber BK, Holzhauser T, Scibilia J et al; Clinical characteristics of soybean allergy in Europe: a double-blind, placebo-controlled food challenge study. J Allergy Clin Immunol;2007; Vol.119(6):1489–1496.
11. Krishna MT, Mavroleon G, Holgate ST, Essentials of allergy. Taylor &Francis, New York;2010.
12. Ramesh S. Food allergy overview in children. Clin Rev Allergy Immunol 2008; 34: 217-230.
13. Charles K. Naspitz, Dirceu Solé et al, Sensitization to inhalant and food allergens in Brazilian atopic children by in vitro total and specific IgE assay, Journal de Pediatria; 2004; Vol.80(3):203-10.