

## A CROSS SECTIONAL STUDY ON THE PROFILE OF FOOD ALLERGY AMONG PATIENTS WITH CHRONIC URTICARIA IN KERALA

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### ABSTRACT

#### BACKGROUND

Skin allergy in the form of urticaria is commonly encountered. Food allergy is one of the common aetiologies responsible for this clinical situation. Identifying the offending allergens and avoidance is one of the most important measures which may help in the management of skin allergy. Skin prick test is one of the most reliable and safe method of identifying food allergens.

#### MATERIALS AND METHODS

This study was conducted to identify the skin sensitivity to various food allergens in patients with chronic urticaria and to study the regional pattern of food allergy in Kerala. 100 atopic patients with complaints of chronic urticaria were selected for the study. Skin prick allergy testing with 30 food allergens were performed in the above patients by skin prick test method.

#### RESULTS

98% of patients with chronic urticaria had some form of food allergy. Common offending food allergens were wheat (28%), garlic (22%), ground nut (20%), cashew nut (18%), prawns (17%), ginger (16%), peas (12%) and black pepper (10%).

#### CONCLUSION

Food allergy is common in chronic urticaria. Skin prick test is a reliable and safe method to identify food allergens. Most common offending food allergens were wheat, garlic, ground nut, cashew nut, prawns, ginger, peas and black pepper.

#### KEYWORDS

Food Allergy, Chronic Urticaria, Allergy Testing, IgE, Skin Prick Testing (SPT).

**HOW TO CITE THIS ARTICLE:** Panicker V, Sulaiman SP.A cross sectional study on the profile of food allergy among patients with chronic urticaria in Kerala. J. Evid. Based Med. Healthc. 2017; 4(26), 1501-1504. DOI: 10.18410/jebmh/2017/293

#### BACKGROUND

Urticaria, also called hives/welts/wheals, is a common disorder with a prevalence of around 15 to 20 percent in the general population. Usually, urticaria presents as intensely pruritic, erythematous plaques. They may be round, annular, or serpiginous, and variable in size. Usually, the lesions are extremely pruritic affecting the patient's work, school, and sleep. The pruritus of chronic urticaria is more prominent at night. Urticaria may be accompanied by angioedema, which is swelling deeper in the skin.

Chronic urticaria is defined as urticaria on most days of the week, for a period of six weeks or longer. Prevalence of chronic urticaria is around 1 percent in general population. Up to 40 percent of patients with chronic urticaria have

accompanying angioedema. Both children and adults can develop chronic urticaria, although it is more common in adults. Women are affected twice as often as men, and the common age group affected is between 30-50 years of age.

It is not easy to identify the causative agent in most of the patients with urticaria. Physical urticaria are induced by environmental stimuli like heat, cold, pressure applied to the skin, exercise, water, vibration, and sunlight. Chronic urticaria is often associated with autoimmune diseases, malignancies, thyroid disorders, and food allergy.

Untoward reactions to food and its components are common and roughly 20% of the world population believe that they have some kind of 'food allergy'. It includes immune mediated food allergies and non-immune mediated food intolerances. These two reactions are often confused by the patients, the public and even by the health professionals. They vary in clinical presentation, severity, response to treatment and future occurrences.

Food allergy is an adverse immune-mediated response, which is reproducible in nature on ingestion, skin contact or even smell of a food or its constituents and is absent during avoidance.

Other types of undesirable reactions to food stuff which do not involve the immune system are really not food

*Financial or Other, Competing Interest: None.  
Submission 07-03-2017, Peer Review 14-03-2017,  
Acceptance 27-03-2017, Published 28-03-2017.*

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DOI: 10.18410/jebmh/2017/293*



allergy and the term food intolerance should be better used for such cases. Irrespective of the nature of the reaction, these disturbances are fairly common and disturbing. Many were forced to avoid foods of their choice. 20% of the UK population in a house hold survey reported food intolerances but the prevalence of true reactions was less than 2% when double-blind placebo-controlled food challenges were performed. Similarly, studies from Germany using postal questionnaire revealed one third of the population reported intolerance to various food materials while the true prevalence of adverse food reactions was 3.6%, of which more than two thirds were IgE-mediated.

Food allergy can occur in isolation or in association with various clinical conditions such as chronic urticaria. The prevalence of food allergy is on the rise, owing probably to the changing food habits, multiplicity of food items with innumerable components and overuse of food additives and colouring agents.

Identifying the offending allergens and avoidance is one of the most important measures which may help in the management of skin allergy. Skin prick test is one of the most reliable and safe method of identifying food allergens.<sup>1</sup> Accurate diagnosis and prompt management of chronic urticaria is important as it is often disabling and unpredictable in nature and occurrence. The treatment of chronic urticaria is challenging and if the aetiology is food allergy the patients can lead a normal life by simply avoiding the offending foods and its components. Food allergy is an important causative factor in the development of chronic urticaria and such cases should be referred to an allergist for evaluation and assessment by appropriate measures.

**Objectives**

This descriptive study was conducted at Alappuzha, a district of Kerala, India with the following objectives.

1. To study the incidence of food allergy among patients with chronic urticaria.
2. To study skin sensitivity to various food allergens in patients with chronic urticaria.
3. To identify the regional pattern of food allergy in Kerala

**MATERIALS AND METHODS**

**Inclusion Criteria**

Atopic patients with complaints of chronic urticaria were selected for the study.

**Exclusion Criteria**

1. Non-atopic patients with normal or mildly elevated serum IgE levels (less than 250 IU/mL).
2. Patients with age less than 15 and more than 60.
3. Patients with other causes of urticaria (e.g. Malignancy, hereditary angioneurotic oedema, etc).
4. Patients with skin allergy other than urticaria like eczema, atopic dermatitis, contact allergic dermatitis, etc.

5. Patients with acute or uncontrolled urticaria were not included, because of the difficulty in doing skin testing in such patients.
6. Patients with gross dermatographism were excluded from the study.
7. Since the study was aimed to identify the regional pattern of drug allergy, patients outside Kerala were excluded from the study.

**MATERIALS AND METHODS**

A detailed history of past incidences of urticaria and food allergy was taken in all patients. Pre-test pattern of allergy obtained from history and old documents were shown in Table 1.

The patient’s atopic status was evaluated by probing into a history of any other allergies in the past like asthma, allergic rhinitis, skin allergy or food allergy. Total serum IgE was estimated in all patients by fully automated Bi-directional Interfaced Chemiluminescent immunoassay method to assess the atopic status.

Allergy testing with 30 food allergens was performed in the above patients by skin prick test method. List of the allergens tested are given in table 2. Skin testing and reading were conducted as per criteria laid by American Academy of Allergy, Asthma and Immunology.<sup>1</sup> (AAAAI) and British Society for Allergy and Clinical Immunology.<sup>2</sup> (BSACI) guidelines for the management of drug allergy. Patients were asked not to take antihistamines or steroids prior to 72 hours of testing.<sup>1</sup> The reaction was checked at 15-20 minutes. Buffered saline was used as negative control and histamine as positive control. A positive reaction is a wheal size of diameter of 3mm or more greater than negative control, surrounded by a flare.

Pre-test pattern of allergy obtained from history and old documents were shown in table 1.

Drug	Number of Allergic Patients
Prawns	31%
Wheat	14%
Cannot identify	24%
No history suggestive of food allergy	31%

**Table 1. Pre-test Pattern of Allergy among Patients**

**RESULTS**

Total number of patients- 100.

Sex distribution- Male -52 (52%), Female -48 (48%).

Age- ranged from 15 to 60 with an average of 32 years.

Serum IgE levels- The serum IgE values ranged from 254 IU/mL to 7748 IU/mL, with an average value of 2009 IU/mL.

**Pattern of Allergy**

All the patients, except two were found to be allergic to at least one of the food allergens tested (98%). 79 patients (79%) had allergy to more than one antigen. Only 19 patients (19%) were found to be allergic to a single food

allergen. While 21% were allergic to two antigens, 16% were allergic to three allergens and the rest 42 patients (42%) were allergic to more than three antigens. Two patients were found not to be allergic to any of the food allergens tested. No patients were found to be allergic to two food items- dal urad and dal moong. None of the 100 patients developed any immediate or late complications following intradermal allergy testing.

Most common offending allergens were wheat (28%), garlic (22%), ground nut (20%), cashew nut (18%), prawns (17%), ginger (16%), peas (12%) and black pepper (10%).

No relation could be established between age and sex of the patient and the number or variety of food allergens could be established.

Sl. No.	Allergen	Number of Patients Found to be Allergic No. = %	Sl. No.	Allergen	Number of Patients Found to be Allergic No. = %
1	Wheat	28	16	Haldi	5
2	Garlic	22	17	Lemon	5
3	Ground nut	20	18	Banana	5
4	Cashew nut	18	19	Gram	4
5	Prawns	17	20	Milk	4
6	Ginger	16	21	Rice	4
7	Peas	12	22	Onion	3
8	Black pepper	10	23	Coffee	3
9	Mutton	9	24	Orange	2
10	Egg white	9	25	Tea	2
11	Fish	8	26	Tomato	1
12	Chicken	8	27	Apple	1
13	Beef	7	28	Dal arhar	1
14	Potato	6	29	Dal urad	0
15	Mustard	6	30	Dal moong	0

**Table 1. List of Food Allergens Tested and Frequency of Allergy to Various Food Items**

**DISCUSSION**

Urticaria, commonly referred to as hives, appears as raised, well-circumscribed areas of erythema and oedema involving the dermis and epidermis that are very pruritic.<sup>3</sup>It may be acute (<6 weeks) or chronic (>6 weeks). Urticaria is one of the commonest forms of skin allergy. Skin allergy is most often due to ingested food allergens. Detection of food allergens responsible for the disease helps in prescribing avoidance diet, which is an important step in the management of food allergy. Skin prick allergy testing is an efficient and safe method of doing allergy testing.

98 percent of the patients with urticaria seems to be allergic to at least one food item. So it can be concluded

that one major aetiological factor in urticaria is food allergy.

The pre-test history reveals that wheat and prawn allergy are responsible for 45 percent patients. The testing also confirms allergy to these common antigens. However, majority of patients (55%) cannot identify the food item responsible without testing. Also 79% of patients had allergy to multiple foods. This signifies the importance of allergy testing in identifying food allergy in patients with urticaria.

Food allergy pattern varies regionally. In order of prevalence, the most common food allergens in all ages in Western countries are citrus fruits, tomato, egg, strawberry, soy, wheat and fish.<sup>4</sup> It has been reported that common food allergens among Indians are cashew nut, coconut, wheat, fish (especially shellfish), peanut, milk, egg, meat, rice, etc.<sup>5</sup>

In this study, most common offending allergens were wheat, garlic, ground nut, cashew nut, prawns, ginger, peas and black pepper. This pattern is somewhat different from the previous studies. Earlier studies have documented that allergy to spices are rare except for mustard and garlic.<sup>6</sup> But in this study, allergy to spices like pepper and ginger are also frequent. Unlike in the western population, allergy to citrus fruits like orange, lemon and tomato are not common in Kerala. Allergy to dal items also seems to be uncommon in Kerala.

In comparison with a previous study by the same author<sup>7</sup> which was done by intradermal testing method, the results and the allergy pattern are comparable. Skin prick test which is less invasive seems to be at least equally effective in identifying food allergens.

**CONCLUSION**

1. Food allergy is quite common among patients with urticaria (98%).
2. Skin prick testing is an efficient and safe method to identify food allergens.
3. Most patients with food allergy are allergic to multiple allergens (79%).
4. Most commonly encountered allergens, in the order of prevalence are wheat, garlic, nuts, ginger, prawns, peas and black pepper.
5. Allergy to spices is not rare as previously reported.
6. Allergy to citrus fruits is not as common as in Western population.
7. There is no apparent relation between age and sex of the patient with food allergy.

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