# Food allergy test in chronic urticaria adult patients: A cross sectional study

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## Abstract

**Introduction:** Chronic urticaria is a distressing cutaneous allergic condition with diverse clinical presentations which can affect the physical and psychological aspects of both adult and paediatric group of patients. Food allergens are considered to be one of the common aetiology in adult chronic urticaria patients. The best way to prevent it is by taking specific measures to avoid or reduce the consumption of offending food allergens that causes signs and symptoms, suspected food allergies should be evaluated clinically, diagnosed with skin prick test as well as blood test and treated by a qualified medical professional.

**Materials and Methods:** This is a cross –sectional study conducted in 100 adult chronic urticaria patients visiting the out-patient department of dermatology, Azeezia medical college, Kollam from a period of December 2017 to December 2018. This study was conducted to know the prevalence of food allergens in chronic urticarial patients with the help of skin prick test with 32 food antigens.

**Results:** Almost 99% of patients with chronic urticaria had some sorts of food allergy. Major offending food allergens were Haldi (16.2%), cashew nut (14.1%), mustard (12.1%), saunf (12.1%), milk and chicken (11.1%), garlic, ginger, gram, apple and fish (9.1%), banana and coffee (8.1%).

**Conclusion:** Food allergy is one of the common cause for cutaneous distressing diseases like chronic Urticaria, which can impair the mental and physical well-being of patients. Specific diagnosis, evaluation and treatment of the above mentioned condition can improve the general aspects of urticarial patients. Main offending food allergens were Haldi (16.2%), cashew nut (14.1%), mustard (12.1%), saunf (12.1%), milk and chicken (11.1%), garlic, ginger, gram, apple and fish (9.1%), banana and coffee (8.1%). Skin prick test is one of the cheapest and fairly effective tool in the diagnosis of Chronic Idiopathic urticaria.

**Keywords:** Food allergy, Chronic urticaria (CU), Allergy testing, IgE, Skin prick testing (SPT).

## Introduction

Chronic Urticaria (CU) is a disease characterized by the appearance of spontaneous wheals with or without angioedema for more than 6 weeks duration.[1] Chronic Urticaria is a common dermatological disease which encounters many physical and psychological burden on the patients.[2] A food allergy is defined as an adverse effect arising from a specific immune response, which occurs reproducibly on exposure to a given food.[3-5] The skin diseases that are related to food allergy include urticaria, oral allergy syndrome, and atopic dermatitis.[5] Cutanous reactions occur when Immunoglobulin (IgE) bind to mast cells and release histamine as well as other mediators when patient is exposed to certain triggering food allergens. Still the role of food antigens in chronic urticarial patient remains debatable. In our country, the prevalence of food allergy is increasing mainly due to the accessibility to multiple food items with countless ingredients and excess use of food additives like colouring and flavouring agents in the processing of foods. Identification of the hidden food allergens in our daily diet and taking enough necessary measures to reduce its consumption may help in the management of cutaneous allergies like chronic idiopathic urticaria.

### Patients' Selection

This is a cross –sectional study conducted in 100 adult consenting patients with chronic urticaria visiting the out-patient department of dermatology, venereology and leprosy, Azeezia medical college, Kollam from a period of December 2017 to December 2018.These patients were selected randomly and were subjected to medical history, complete medical examination, and routine lab test that included CBC, RFT, LFT, thyroid profile, absolute eosinophil count and serum Ig E and if any patient established to have one or more exclusion criteria was omitted.

Those patients who fulfilled the inclusion criteria were asked to stop the consumption of systemic medication like calcineurin inhibitors, antidepressants, Antihistamines for 3 days and topical as well as oral steroids for 14 days prior to the food allergy test, since most of these medications can hinder with proper elucidation of the test results. Prior to test resuscitative equipment and measures to counteract anaphylaxis was kept ready. The Skin Prick Test (SPT) was done at an area devoid of any prior skin lesion. In all patients, the SPT was done on the ventral side of both arm and forearm about 1-2cm from antecubital fossae and 2-4cm from wrist with a distance of more than 2cm between 2 skin pick test in order to avoid false positive reaction due to direct contamination of nearby test or secondary to axon reflex.[6] The assessment of food allergy test initiated with the application of negative control initially and finished with positive control. Histamine phosphate 10mg/ml and Buffered saline in glycerol base was used as positive and negative control, respectively. Patients were exposed to a series of 32 different food allergens. For each allergen new needle was used and wiping done with different cotton to avoid cross contamination. Each prick was done with a drop of purified allergen extract puncturing over cleansed volar aspect both forearm and arm without inducing bleeding. A timer was used so that all test including negative and

positive control results were read 20 minutes following application. A standard ruler was used to measure the wheal. The longitudinal and vertical diameter was marked with a pen. Positive and negative controls are measured first. To check credibility of results, negative control should give a negative results and positive control histamine should give a positive results since we got expected results from both control, results are considered as true positive. We measured the maximum diameter of the wheal of each particular test and a positive result achieved if diameter of wheal is more than twice the diameter of negative control and if the diameter is exactly twice the diameter of negative control then those results was recorded as doubtful positive.

**Objective**

This study was conducted to know the prevalence of food allergens in chronic urticarial patients with the help of skin prick test with 32 food antigens

**Inclusion Criteria**

All adult chronic urticarial patients, irrespective of sex aged 18-60 years not on any offending drugs and antihistamines complaining of appearance of spontaneous wheals (Urticaria) with or without the signs of angioedema detected by the patient for more than 6 weeks duration were included in the study

**Exclusion Criteria**

1. Patients with any other causes of urticaria.
2. Individuals with any other allergic diseases (such as Asthma, allergic Rhinitis, Allergic Conjunctivitis, Drug Allergy, atopic Dermatitis, Anaphylaxis….)
3. Patients suffering from other chronic or systemic illness (such as respiratory, renal, Cardiac, haematological, hepatic, thyroid or other skin Diseases, etc…)
4. Patient with age less than 18 years and more than 60 years
5. Pregnant and lactating mothers are completely excluded from the study
6. Patients with active Infections, dental caries, sore throat, UTI etc.

**Statistical Analysis**

Qualitative data analysed using Proportion

Quantitative data analysed using mean and standard deviation.

## Results

Out of 100 chronic urticarial patients (68.7%) of patients were females and (31.3%) male patients) with mean age of (36.80+/- 1.249). Majority of patients were positive for some forms of vegetables (27.3%) and fruits (23.2%). In this study, common offending food allergens were Haldi (16.2%), cashew nut (14.1%), mustard (12.1%), saunf (12.1%), milk and chicken (11.1%), garlic, ginger, gram, apple and fish (9.1%), banana and coffee (8.1%).

Serum IgE levels of the 100 chronic urticaria patients ranged from 283 IU/mL to 1500 IU/mL (with an average value of 833IU/mL)

**Fig. 1:** Frequency of pattern of allergy to various foods

| Food | Positive (%) | Doubtful positive (%) | Negative (%) |
|---|---|---|---|
| Cereals | 17.2 | 13.1 | 69.7 |
| Vegetables | 27.3 | 21.2 | 51.5 |
| Fruits | 23.2 | 24.2 | 52.5 |
| Pulses | 13.1 | 10.1 | 76.8 |

**Fig. 2:** Frequency of food allergy to specific food

| S. No | Food Allergen n=31 | No of Patients (n=100) n=100=% | | | S. No | Food Allergen n=31 | No of Patients, (n=100) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Positive (%) | Doubtful Positive (%) | Negative (%) | | | Positive (%) | Doubtful positive (%) | Negative (%) |
| 1 | Apple | 9.1 | 4 | 86.9 | 16 | Haldi | 16.2 | 8.1 | 75.8 |
| 2 | Banana | 8.1 | 10.1 | 81.8 | 17 | Lemon | 7.1 | 8.1 | 84.8 |
| 3 | Black pepper | 3.0 | 4.0 | 92.9 | 18 | Mustard | 12.1 | 10.1 | 77.8 |
| 4 | Cashew nut | 14.1 | 11.1 | 74.7 | 19 | Milk | 11.1 | 5.1 | 83.8 |
| 5 | Chicken | 11.1 | 5.1 | 83.8 | 20 | Saunf | 12.1 | 7.1 | 80.8 |
| 6 | Coffe | 8.1 | 4.0 | 87.9 | 21 | Orange | 1.0 | 9.1 | 89.9 |
| 7 | Dal urud | 6.1 | 5.1 | 88.9 | 22 | Onion | 2.0 | 5.1 | 92.9 |
| 8 | Dal arhar | 6.1 | 6.1 | 87.9 | 23 | Pea | 6.1 | 4.0 | 89.9 |
| 9 | Dalmoong | 3.0 | 2.0 | 94.9 | 24 | Prawn | 3.0 | 8.1 | 88.9 |
| 10 | Egg white | 4.0 | 7.1 | 88.9 | 25 | Rice | 5.1 | 5.1 | 89.9 |
| 11 | Fish | 9.1 | 9.1 | 89.9 | 26 | Tea leaves | 3.0 | 4.0 | 92.9 |
| 12 | Garlic | 9.1 | 9.1 | 81.8 | 27 | Tomato | 4.0 | 3.0 | 92.9 |
| 13 | Ground nut | 7.1 | 4.0 | 88.9 | 28 | Potato | 3.0 | 4.0 | 92.9 |
| 14 | Ginger | 9.1 | 2 | 88.9 | 29 | Wheat | 6.1 | 8.1 | 85.9 |
| 15 | Gram | 9.1 | 4.0 | 86.9 | 30 | Bean | 3.0 | 3.0 | 93.9 |
| | | | | | 31 | Maize | 5.1 | 3.0 | 91.9 |

## Discussion

Food allergy could become an enormous problem in India. In reality it is becoming a global problem. Most of the people are adopting a modern life style and are noticing burgeoning rates of allergic diseases across age groups. Food allergies can cause alarming rates of emergency treatment due to life threatening conditions like Anaphylaxis and even death.

Indian cuisine consist of a wide variety of diverse and unique ingredients and is often considered to cause many skin allergies, probably due to pseudo allergic reactions to additives, aromatic compound, artificial preservatives used in food consumed daily and especially to food eaten from restaurants. It is not known how much quantity to be consumed in order to precipitate an attack.

Chronic spontaneous urticaria (CSU) can appear at any moment and for that reason patients associate foods, drugs, and different activities as possible triggers of their exacerbations.[7,8] In CSU it is common for patients to associate the onset of symptoms with different activities,[9] medications,[7] or foods[8,10] that they were performing or consuming near the time of the reaction. This can lead to unnecessary restriction which can lead to nutritional deficiencies in future. 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.[11] It has been reported that common food allergens in India are cashew nut, coconut, wheat, Fish (especially shellfish), peanut, milk, egg, meat, rice, etc. Among patients tested for food allergens 99% found to have allergy to one or more food allergens which signifies importance of food allergy testing in patients with chronic Urticaria.[12] Majority of patients (84%) cannot identify the food item responsible for allergy without testing.

In our study majority of patients were allergic to vegetables (27.3%) and Fruits (23.2%). The most common offending specific food allergens were Haldi (16.2%), cashew nut (14.1%), mustard (12.1%), saunf (12.1%), milk and chicken (11.1%), garlic, ginger, gram, apple and fish (9.1%), banana and coffee (8.1%). Allergic to citrus fruits and tomatoes are not much common in India like in Western population.

We found that on follow-up visits to our department, Patients reported significant symptomatic improvement after avoiding the specific food from their diet to which they had elicited a positive reaction to food allergy test. There by, Treatment strategy include identifying the aetiology, avoidance of aggravating factors and symptomatic management.

## Conclusion

Food allergy tests have to be recommended early during the medical evaluation to avoid unnecessary avoidance of foods in chronic idiopathic urticarial patients. Skin prick test is safe and inexpensive method to detect food antigens in these patients.

**Conflict of Interest:** None.

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