

A study of skin prick in patients with chronic urticaria

Meryl Sonia Rebello^{1*}, Ramesh Bhat M², Sukumar D³, Geethu F Alapatt⁴

^{1,4}PG Student, ²Professor and HOD, ³Professor, Department of Dermatology, Father Muller Medical College, Kankanady, Mangalore-575002, Karnataka, INDIA.

Email: rebello.meryl@gmail.com

Abstract

Background: Chronic urticaria can be caused by a number of known and unknown allergens. Some of these allergens can be identified by prick tests. **Objectives:** To assess the positivity of skin prick test (SPT) in patients with chronic urticaria. **Patients and Methods:** Forty patients diagnosed with chronic urticaria attending Skin department of our institute were included in the study and evaluated by prick testing. **Results:** Among the 40 patients, 33 patients showed positive reactions to various allergens tested i.e 82.5%. The mean age of the patients was 30 years. Female to male ratio was 1.6:1. On SPT, number of patients with 1-5 positive reactions were 13, 6-10 were 15 and more than 10 were 5 patients. Ten most common allergens in order of their frequency include mite D-farinae (52), mite D-pteronyssinus (48), cockroach (32), prawn(28), housefly (25), chicken (22), cyanodon (22), parthenium (20), mosquito (20), crab (16). The five most common food allergen positivity include prawn (29%), chicken (24%), wheat (18%), crab (16%), black pepper(13%). **Conclusions:** A greater proportion of patients with chronic urticaria demonstrate sensitivity to house dust mites, cockroach, pollens along with food. Thus, SPT is an important diagnostic procedure in cases of chronic urticaria, It is also important to perform SPTs among patients suffering from chronic urticaria not only for food allergens but also for pollens, house dust mites.

Keywords: Urticaria, skin prick test, allergens, mites, insects, food.

*Address for Correspondence:

Dr. Meryl Sonia Rebello, PG Student, Department of Dermatology, Father Muller Medical College, Kankanady, Mangalore-575002, Karnataka, INDIA.

Email: rebello.meryl@gmail.com

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INTRODUCTION

Urticaria refers to the immediate hypersensitivity reaction to environmental allergens.¹ It is characterized by appearance of wheals and flare reaction which may occur virtually on any part of the body. Chronic urticaria is one of the challenging problems faced by the clinicians on a daily basis. It is defined as daily or almost daily occurrence of urticarial wheals for at least 6 weeks.² Various physical agents can trigger the onset of urticaria, such as cold, heat, the sun, vibrations, rubbing

(dermographism), or pressure. Urticaria can also be caused by drugs, food, infection (viral, bacterial, parasitic, or fungal), insect stings, systemic diseases like connective tissue diseases, thyroid disorders, malignancies and inhalants like pollens, dust mites, smoke.^{3,4} The pathogenesis of chronic urticaria is complex and it involves production of IgE antibodies and a network of interaction between various cells and chemical mediators, this further leads to production of lymphocytes, monocytes which are attracted to the site and promote an inflammatory reaction.⁵ Skin test reactions depends on three factors: (1) an intact immune system; (2) the presence of IgE sensitized mast cells that release mediators when exposed to antigen; (3) and skin that responds to histamine with the development of erythema and induration. Although these manifestations of an allergic response depend on prior exposure to environmental antigen, they do not measure the amount of exposure in the environment. Hence for assessing the presence of allergen, specific IgE antibodies, allergy skin testing is preferred over blood allergy test. It is more sensitive and specific, simpler to use and less expensive.¹

With this viewpoint, we took up this study with the objective to assess the positivity of skin prick test in patients with chronic urticaria

MATERIALS AND METHODS

Source of data

This is a prospective study. Cases for the study were all clinically diagnosed cases of urticaria attending the Dermatology out-patient department of a tertiary hospital

Method of collection of data

Ethical clearance was obtained from Ethics Committee of the institution. Data was collected with a sample size of 40 patients from March 2014 to April 2015. A written informed consent was taken from each patient enrolled in this study. Patients 18 yrs of age and above and of either sex with presence of history suggestive of urticaria were included in the study. Those patients with physical urticaria, urticarial vasculitis, autoimmune urticaria, contact urticaria, urticaria associated with fever/chills, urticaria related to menstruation or pregnancy, connective tissue diseases, thyroid disorders, dental caries, worms in stool, immunosuppression were excluded from the study. A detailed history and clinical examination was carried out. Prior to the test patients were asked to stop any oral short acting antihistamines for 3days, long acting antihistamines and oral steroids for 7 days . Allergens for the prick test were used from Credisol laboratories. They were as follows

| | | | |
|----|------------|----|--------------|
| 43 | Chikoo | 44 | Capsicum |
| 45 | Dates | 46 | Cardamum |
| 47 | Butter | 48 | Betal leaf |
| 49 | Asafoetida | 50 | Sweet potato |
| 51 | Ajinomoto | 52 | Dalda |
| 53 | Clove | 54 | Curd |
| 55 | Tobacco | 56 | Sugarcane |
| 57 | Beef | | |

Patient were tested for these allergens in 2 sittings, one week apart. Two controls, positive histamine and negative saline were taken. Skin prick test was performed as follows: Skin markings were done over the flexor aspect of both forearms. Different allergens were applied over the markings made. With help of lancet/ needle, gentle tent was given over the skin along with drop of allergen and punctured . The results were read at 15 min by measuring the size of histamine and the allergen prick sites using a measuring scale. Results were graded as: 2+ = half of the size of histamine, 3+ = equal to histamine, 4+ = more than half of histamine. Data was analysed using mean, frequency and percentage

RESULTS

A total of 40 patients who attended our dermatology outpatient department diagnosed with chronic urticaria were taken up for the study. Among the 40 patients, 33 patients showed positive reactions to various allergens tested i.e. 82.5%. The mean age of the patients was 30 years with youngest being 18 yrs and oldest 48 yrs as seen in Table 1 . Out of the 40 patients included in the study, majority were females i.e. 25 (62.5%) and males were 15 (37.5%) as seen in the table 2. The female to male ratio was 1.6:1. On skin prick test, number of patients with 1-5 positive reactions were 13, 6-10 were 15 and more than 10 were 5 patients. Majority of females (67%) had positive skin prick test results compared to males (33%). Ten most common allergens in order of their frequency include mite D-farinae (52), mite D-pteronyssinus (48), cockroach (32), prawn (28), housefly (25), chicken (22), cyanodon (22), parthenium (20),mosquito (20), crab (16). The five most common food allergen positivity include prawn (29%), chicken (24%),wheat (18%), crab (16%), black pepper(13%)

Table 1:

| Sl.No | Allergen | Sl.No | Allergen |
|-------|----------------|-------|----------------------|
| A | Mite D-Farinae | B | Mite D-Pteronyssinus |
| C | Cyanodon | D | Parthenium |
| E | Xanthium | F | Cockroach |
| G | Mosquito | H | Housefly |
| 1 | Rice | 2 | Wheat |
| 3 | Gram Bengal | 4 | Mustard |
| 5 | Dal arhar | 6 | Banana |
| 7 | Milk | 8 | Egg whole |
| 9 | Pineapple | 10 | Peanut |
| 11 | Yeast | 12 | Onion |
| 13 | Garlic | 14 | Dal urad |
| 15 | Mutton | 16 | Chicken |
| 17 | Crab | 18 | Prawn |
| 19 | Cashew nut | 20 | Turmeric |
| 21 | Black pepper | 22 | Cabbage |
| 23 | Papaya | 24 | Tamarind |
| 25 | Mango | 26 | Cauliflower |
| 27 | Ginger | 28 | Spinach |
| 29 | Fish (sardine) | 30 | Lobster |
| 31 | Watermelon | 32 | Cinnamon |
| 33 | Drum stick | 34 | Ladys finger |
| 35 | Brinjal | 36 | Chocolate |
| 37 | Pista | 38 | Coconut |
| 39 | Curry leaves | 40 | Mint |
| 41 | Jackfruit | 42 | Bitter gourd |

Table 1: Mean age and Standard deviation of chronic urticaria patients

| | N | Minimum | Maximum | Mean | Std. Deviation |
|-----|----|---------|---------|-------|----------------|
| Age | 40 | 18 | 48 | 30.00 | 9.584 |

Table 2: Sex distribution

| | Frequency | Percent |
|--------------|-----------|--------------|
| Female | 25 | 62.5 |
| Male | 15 | 37.5 |
| Total | 40 | 100.0 |

Table 3: Number of patients with positive reaction based on the number of allergens

| | | Positive reaction | | | Total |
|--------------|--------|-------------------|-----------|----------|-----------|
| | | 1-5 | 6-10 | >10 | |
| SEX | Female | 8 | 9 | 4 | 21 |
| | Male | 5 | 6 | 1 | 12 |
| Total | | 13 | 15 | 5 | 33 |

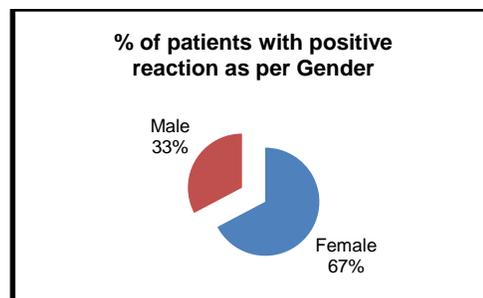


Figure 1

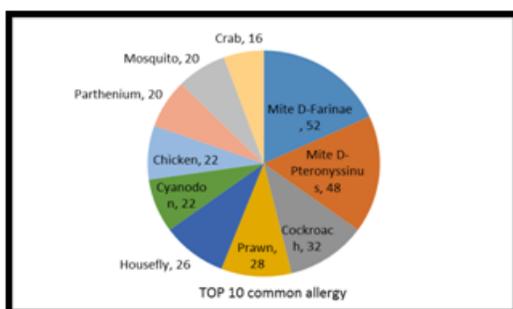


Figure 2: Ten most common allergens

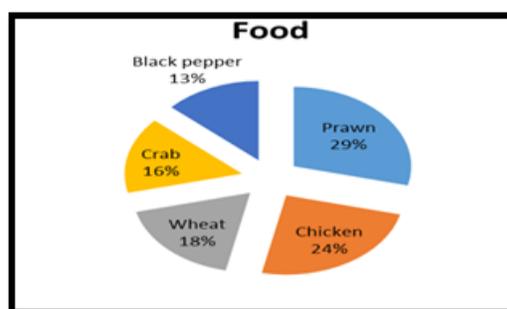


Figure 3: Most common food allergens

DISCUSSION

Skin prick testing (SPT) is a reliable method to diagnose IgE-mediated allergic disease. It provides evidence for sensitization and can help to confirm the diagnosis of a suspected type I allergy. It is minimally invasive, inexpensive and results are immediately available.¹ Thus, skin prick test is an important diagnostic procedure when all other investigations seem to be fruitless.² A negative skin test for a particular allergen, if properly performed, can virtually exclude that allergen as the responsible agent. An elimination diet can lead to improvement in many patients who have positive prick test reactions to food or food additives. Manifestations of an allergic response is due to prior exposure to an environmental antigen and does not depend on the amount of exposure. Hence skin prick testing is a better test compared to blood allergy testing. Among the 40 patients in our study, 33 patients showed positive reactions to various allergens tested i.e. 82.5% compared to other studies which showed 44%,² 63.41%.⁶ Another study demonstrated a 34.9% prevalence of positive SPT to mites in CU patients⁷. The mean age of the patients was 30 years which was comparable to a study by Nath *et al* where the mean age was 33 yrs and Kulthanan *et al* being 37.1yrs . Out of the 40 patients included in the study , majority were females i.e. 25 (62.5%) and males were 15 (37.5%), The female to male ratio was 1.6:1 .Few other studies have also shown female preponderance.^{2,7} Majority of females (67%) had positive skin prick test results compared to males (33%).

In our study, the most common allergens were mites(50%), followed by insects (32%), food(28%) and pollen (22%) . Ten most common allergens in order of their frequency include mite D-farinae (52), mite D- pteronyssinus (48), cockroach (32), prawn(28), housefly (25), chicken (22), cyanodon (22), parthenium (20),mosquito (20), crab (16). The five most common food allergen positivity include prawn (29%), chicken (24%), wheat (18%), crab (16%), black pepper(13%). According to Parasuramalu, *et al* , most common allergen found positive was food(54%) followed by mites and pollens. In a study by Nath *et al* , maximum number of positive reactions were seen with insects and pollens (24%), followed by food items (22%), animal danders (14%), house dust mite (12%) .² In a study by Bains *et al* out of the 41 patients of chronic urticaria, the most common allergen showing SPT positivity were dust and pollen, each comprising 26.83% patients followed by food (21.6%), insects (17.07%), and *miteD- farinae* (7.32%).

CONCLUSION

This study suggests a possible association of mite and pollen sensitivity with chronic urticaria in addition to food. It is important to perform SPTs among patients suffering from chronic urticaria (with or without comorbidities) not only for food allergens but also for pollens, house dust mites and other allergens for diagnosis and proper management. Elimination therapy

will be helpful in these patients thereby improving their quality of life. The role of SPTs in diagnosis and guiding immunotherapy in allergic disorders is immense; this information may be useful to clinicians managing patients suffering from such disorders.⁸

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