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Original Research Article

Autologous serum skin test and skin prick test in patients with chronic urticaria: a cross sectional study

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ABSTRACT

Background: Urticaria is an allergic skin disorder characterized by wheals. Though the diagnosis is easy, it is difficult to identify the cause for the episodes. Autologous serum skin test (ASST) and skin prick test (SPT) help in the identification of the cause. The objective of the study was to determine the frequency of ASST and SPT positivity in patients with chronic idiopathic urticaria (CIU).
Methods: Fifty-six patients attending the dermatology OPD with chronic idiopathic urticaria were evaluated and taken up for the study. ASST and SPT were performed on all the patients and the obtained results were documented. Data was analyzed using Chi square test.
Results: Among the 56 patients studied, males (53.57%) outnumbered females and the majority was in the age group 21 to 30 years (33.9%). One third of the study patients gave history of known food allergy and 10.7% gave history of dust allergy. ASST positivity was seen in 30.3% and SPT positivity was seen in 64.3%. Ten of our patients (17.8%) were positive to both ASST and SPT. Amongst the SPT positives 33.3% showed positivity to food allergens, 19.4% showed positivity to aeroallergens and 47.2% showed positivity to both.
Conclusions: ASST and SPT are two reliable tools in identifying the cause for urticaria and this in turn helps in avoidance of possible causes and providing proper treatment.

Keywords: Chronic urticaria, ASST, SPT

INTRODUCTION

Urticaria is a condition that presents with wheals or angioedema or both. Urticaria can be acute, chronic or intermittent in nature. Urticaria lasting for less than 6 weeks is considered as acute and that occurring on most of the days of a week, for more than 6 weeks is termed chronic urticaria (CU). A large number of patients with CU do not have a well-described cause and hence it is called chronic idiopathic urticaria (CIU). Several factors contribute in provocation of the symptoms and they include food, food additives, inhalants (pollen, moulds, animal dander and house-dust mites), etc. The main pathogenic mechanism involved in CIU is mast cell degranulation and histamine release either by mast cell activating factors which are anti IgE receptor antibodies or by triggering agents like food, aero-allergens, etc. This forms the basis for ASST and SPT respectively. The positive results in ASST give an approximate idea of basophil and mast cell histamine releasing propensity of a patient with CIU and correlates with the disease activity. It is a reliable screening test. It has a sensitivity of 70% and specificity of 80%.[1,2] SPT has a definite role in identifying the allergens that could trigger the episode of urticaria and can be an important diagnostic procedure in cases where other investigations are fruitless. SPT has a sensitivity of 80- 97% and specificity of 70- 95%.[3]

The study was aimed to determine the frequency of ASST and SPT positivity in patients with CIU.

METHODS

Fifty-six, clinically diagnosed patients with chronic urticaria, (having wheals for more than 6 weeks on most of the days) attending the dermatology OPD at M.S. Ramaiah Medical Teaching Hospital between November 2013 and June 2015 and who wish to give informed consent to carry out ASST and SPT were recruited for the study. Ethical clearance was obtained from the institutional ERB for the study. Diagnosis of CIU was made based on history and clinical examination.

Patients with chronic urticaria in the age range of 18 to 75 years are included in the study. Exclusion criteria were patients with history of urticaria secondary to diabetes, thyroid disease, autoimmune or chronic systemic disorders, other types of urticarial, pregnant and lactating women.

Parameters studied

History of duration, distribution, and size of the lesions, any diurnal and seasonal variation was recorded. History of any food or dust allergy and of atopy in the form of allergic rhinitis, bronchial asthma or atopic dermatitis was noted. Investigations did include complete haemogram, urine routine, random blood sugar and serum TSH. Patients with altered TSH and blood sugars were excluded for the study.

Patients were advised to stop antihistamines for at least 2 days and corticosteroids for at least 2 weeks prior to the test if they were on medications, to avoid false negatives. ASST and SPT were performed according to the standard protocol as mentioned below.

Autologous serum skin test (ASST)

An insulin syringe was used to inject 0.05 ml of fresh undiluted autologous serum intradermally over the volar aspect of the forearm to raise a bleb. Histamine was used as a positive control. 0.05 ml of histamine (50 µl of 10-20 µg/ml histamine solution) and 0.05 ml of normal saline were injected intradermally and each of the 3 injections were placed at least 3cm apart. The wheal was measured after 30 minutes. The test site was compared with the positive control site and a grading of 1+ to 4+ was determined based on the difference of the size of the wheal.[1]

Skin prick test (SPT)

The skin prick test contained standard allergens like food allergens, aeroallergens, house dust mites and insects. The allergen panel used for SPT consisted of 95 food allergens, 40 aeroallergens, and 11 others. The test kit was obtained from Creative diagnostics, Mumbai.

The medial aspect of the forearms and the upper arms were cleaned and test sites for placing the allergens were marked using a marker 2-3 cm away from the wrist and anticubital fossae. Distance between two allergens was kept at 2 cm to avoid false positives either due to direct contamination or due to axon reflex. A drop of each allergen was placed on the skin, in an order mentioned in the series and was pricked immediately using a single headed metal lancet to introduce the allergen. Equal pressure was applied for all the allergens. Histamine dichloride (10 ng/ml or 0.1%) was used as a positive control and saline as negative control. Results were read after 20 minutes. Wheals at the test site were compared with the wheal produced at the positive control site. Largest diameter of the wheal was measured using a plastic scale provided along with the test kit. A wheal of 2 mm more than positive control was considered as positive. Negative control was used to rule out any dermographism.[4]

Statistical analysis

Data obtained was coded and entered into Microsoft excel 2007 spreadsheet. Data was analyzed using IBM SPSS 20.0.

RESULTS

A total of 56 patients comprising of 30 male (53.5%) and 26 female (46.4%) were studied. The age range was 18 to 75 years. The youngest patient was 18 years old and the oldest was 62 years and the majority was in the age group 21 to 30 years.

Eighteen patients (32.1%) gave history of food allergy and 17.8% had a history of dust allergy. A total of 14 patients (25%) gave a history suggestive of atopy. Amongst the 14 patients with atopy, 4 patients had food allergy and 5 patients had dust allergy.

ASST & SPT

Out of 56 patients, 17 (30.3%) were positive to ASST and 36 (64.3%) to SPT. Ten (17.8%) of 17 ASST positives and 26 (46.3%) of 39 ASST negatives were positive to SPT. Seven (12.5%) of ASST positives and 13 (23.2%) of ASST negatives were negative SPT as shown in Table 1.

Table 1: Positivity to both ASST and SPT.

ASST	SPT positive	SPT negative
Positive	10 (17.8%)	7 (12.5%)
Negative	26 (46.4%)	13 (23.2%)

SPT to food and aeroallergens

Of the 36 SPT positives, 12 (33.3%) were positive to the food allergens alone, 7 (19.4%) to aeroallergens alone and 17 patients (47.2%) to both food and aeroallergens as given in Table 2.

Table 2: SPT positivity to food & aeroallergens.

SPT	Frequency
Food allergens alone	12 (33.3%)
Aeroallergens alone	07 (19.4%)
Both food and aeroallergens	17 (47.2%)

DISCUSSION

The study was performed on 56 patients, 30 male (53.7%) and 26 female (46.4%).The mean age of the patients in our study was 33.8 years (range 18 to 62 years). The mean duration of the lesions was 40.2 months. In our study 14 patients (25%) gave history of atopy, 6 patients (10.7%) gave history of symptomatic aggravation to dust (aeroallergens) and 18 patients (32.1%) to food.

In the present study 17 patients (30.3%) had a positive ASST. ASST positivity was marginally high in our study when compared to patients with chronic urticaria by George et al (34%), Baig et al and Hamamy et al (40.7% each) and by Vikramkumar et al (41.6%).[5-8]

Amongst the 17 patients who showed a positive ASST, 11 (64.7%) were female and 6 (35.3%) were male. Two other studies by George et al and Konstantinou et al also showed higher ASST positivity in females (52.9%, and 76% respectively) when compared to males.[1,5]

In our study SPT positivity was seen in 36 of the 56 patients (64.3%) with a male preponderance. This is similar to the value obtained by Bains et al (63.4%). 10 in our study 8 of the 14 (57.1%) with history of atopy showed SPT positivity, which is much lower than in a study by Bains et al which showed 77.7%.[9]

We found that SPT positivity to food allergens alone was 33.3%. Bains et al showed 7.3% and Nath et al showed 50% positivity. The higher rate of SPT positivity in the study conducted by Nath et al could be due to subjective attribution of the symptoms to certain foods in this part of the country.[9,10]

The positivity to aeroallergens in our study was found to be 11.1%. This was much lower compared to the study by Bains et al (41.4%) and Caliskaner et al (24.7%). This could also be due to differences in the environmental factors.[9,11]

In our study we found that 38.89% of the patients were positive to both food and aeroallergens, which was much higher when compared to Bains et al (14.6%).[9]

CONCLUSION

ASST and SPT are two reliable tests in CIU that can be performed as an out-patient procedure with a low downtime for obtaining results. SPT helps in the identification of pre-existing allergy to many food and/ or aeroallergens. Further studies with proper follow up is needed to justify that, the avoidance of the causative allergen will help in reducing the episodes of urticaria.

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