

Autologous Serum Skin Test in Chronic Urticaria

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ABSTRACT

Background: Chronic Urticaria (CU) is a common dermatosis affecting 0.1% population, characterized by recurrent appearance of wheals with or without angioedema for more than 6 weeks. However, in a significant number of these patients, chronic autoimmune urticaria has been identified. Autologous serum skin test (ASST) is a useful diagnostic aid in identifying chronic autoimmune urticaria.

Aim: To assess autologous serum skin test in chronic urticaria.

Methods: A total of 50 patients with chronic urticaria were taken up for the study and ASST was performed in all the patients. Approximately 0.05 ml (equivalent to 2 units on insulin syringe that has 1 ml marked as 40 units) of autologous serum was injected intradermally over flexor aspect of the left forearm. Equal amount of normal saline (negative control) was injected intradermally over flexor aspect of the right forearm. The results were read after 30 minutes. The test was considered positive if wheal and flare response occurred over the left forearm (serum injection site) with a diameter of at least 1.5 mm or more than that of saline induced response.

Results: Out of 50 patients with chronic urticarial, 30 (60%) were autologous serum skin test positive whereas 20 (40%) were autologous serum skin test negative.

Conclusion: Positive autologous serum skin test was seen in 60% of patients. It is a simple, practicable in-vivo intradermal clinical test to differentiate chronic idiopathic urticaria from autoimmune urticaria.

Key Words: Chronic urticaria, Chronic autoimmune urticaria, Autologous serum skin test, In- vivo intradermal test

INTRODUCTION

Chronic urticaria is a common distressing dermatosis characterized by spontaneous occurrence of wheals lasting for less than 24 hours, with or without angioedema occurring daily or almost daily for more than 6 weeks.^{1,2} In majority of the patients with chronic urticaria, the exact etiology remains unknown; hence they have been categorized under the term chronic idiopathic urticaria (50%).³ However in a significant number of patients with chronic urticaria (30-50%), circulating histamine releasing functional autoantibodies directed either against high affinity IgE receptor (anti FcεRIa) on basophils and mast cells or less commonly against the immunoglobulin E (IgE) have been identified. Thereby the term chronic autoimmune urticaria has been assigned to this subgroup of patients.¹

Autologous serum skin test (ASST) is a simple in-vivo intradermal clinical test for the detection of basophil histamine releasing activity.⁴ A positive result in the form of an immediate hypersensitivity reaction (read against a control) signifies the presence of circulating histamine releasing factors (autoantibodies). Hence, ASST is a useful diagnostic aid in identifying chronic autoimmune urticaria. ASST, as an investigative technique has been found to have a sensitivity of approximately 70% and a specificity of 80%.⁵ The present study was taken up to assess autologous serum skin test in patients with chronic urticaria.

MATERIALS AND METHODS

SOURCE OF DATA

This study was conducted in Department of Dermatology, Venereology and Leprosy, Adichunchanagiri Hospital and Research Centre, B.G. Nagara, on out-patient basis. This was a prospective non-randomized uncontrolled study.

SELECTION CRITERIA

Inclusion criteria:

1. Spontaneous appearance of wheals occurring daily or almost daily for more than 6 weeks.
2. Patients aged above 18 years

Exclusion criteria:

1. Pregnant and lactating mother
2. Patients on systemic corticosteroids or immunosuppressive medications in the past 6 weeks.
3. Patients on chemotherapy in the past 1 year.

PROCEDURE OF THE STUDY

All patients attending the Dermatology outpatient department and satisfying the aforementioned inclusion and exclusion criteria were recruited in the study after informed consent and ethical committee approval.

A detailed history was taken as per the prepared questionnaire. Elaborate general, physical and systemic examination was done and recorded in standard proforma. A total of 50 patients with chronic urticaria were taken up for the study and ASST was performed in all the patients.

AUTOLOGOUS SERUM SKIN TEST

Following were the pre-requisites followed prior to performing the autologous serum skin test: Short acting antihistamines (chlorpheniramine maleate, brompheniramine maleate, promethazine hydrochloride) were withdrawn at least 2 to 3 days prior to the test and long acting antihistamines (cetirizine hydrochloride, loratidine, fexofenadine hydrochloride), doxepin were withdrawn 2 to 6 weeks beforehand. Under aseptic precautions, 2ml of patient's venous blood was taken from antecubital vein, collected in a sterile glass tube and allowed to clot for 30 minutes at room temperature. The serum was then separated by centrifugation at 2000 rpm for 15 minutes. Volar aspect of forearm was selected as the test area. Approximately 0.05 ml (equivalent to 2 units on insulin syringe that has 1 ml marked as 40 units) of autologous serum was injected intradermally over flexor aspect of the left forearm. Equal amount of normal saline (negative control) was injected intradermally over flexor aspect of the right forearm. Every time a separate syringe was used for each solution. The results were read after 30 minutes. The test was considered positive if wheal and flare response occurred over the left forearm (serum injection site) with a diameter of at least 1.5 mm or more than that of saline induced response.

RESULTS

Out of 50 patients with chronic urticaria, 30 patients (60%) had a positive reaction to autologous serum. The median age of ASST positive patients was 35 years (range 18-70 years) whereas in the ASST negative group, the median age was 37 years (range 21-70 years). The duration of urticaria ranged from 3 months to 20 years in ASST (+) and 3 months to 10 years in ASST (-) patients. 11 (36.7%) ASST positive patients and 5 (30%) ASST negative patients had history of atopy. A significant higher number of patients in the ASST positive group were graded as "severe" compared to the ASST negative group which was statically significant (66.7 vs. 45%; $p=0.01$). The mean baseline urticaria activity score (UAS) in ASST positive and ASST negative patients were similar.

DISCUSSION

The Autologous serum skin test is a simple, practicable in-vivo intradermal test for the detection of autoimmune urticaria. Though, basophil histamine release assay is the gold standard for detecting functional autoantibodies, the procedure is lengthy, requires fresh basophils from healthy donors and skilled

expertise is desired.⁴ For this reason, the test is generally limited to research laboratory centers.

In our study, the commonest age group with chronic urticaria was 31-40 years with mean age of the patients being 39.40 ± 12.43 which was similar to a study done by Majid *et al*⁶ (age group: 31-40 years; mean age of the patients: 39.40 ± 12.43). Females 64% (32) outnumbered males 36% (18) with male: female ratio being 1:1.8, however in a study done by Majid I *et al*, males outnumbered females with male: female ratio being 2:17. In present study, duration of urticaria ranged from 3 months to 20 years which was similar to study done by Majid I *et al* wherein they also reported that the duration of urticaria ranged from 3 months to 10 years. Dermographism was positive in 28 patients (56%), among which 50% (9) were males and 50% (19) were females. In the present study out of 50 patients with chronic urticaria, 60% (30) patients had positive autologous serum skin test.

Our study results were similar to studies done by Staubach *et al* (62.5%) and Kocaturk *et al*. (63%). In a similar study done by Celen OM *et al* and Bajaj *et al*, almost half of the patients (49.5% and 53.3%) had positive reaction to autologous serum. In contrary, study done by Godse KV, only 26.7% patients had positive autologous serum skin test. (Table 1)

A significant number of patients in the ASST positive group were graded as "severe" compared to ASST negative group and it was statically significant (66.7 vs. 45%; $p = 0.001$). Our study results were in concordance with studies done by Bajaj *et al* (91.9 vs. 69.2%; $P = 0.02$) and Sabroe *et al*. In contrary, studies done by Nettis *et al*¹² and Staubach *et al*⁸ observed no or only subtle differences in the symptomology of ASST (+) and ASST (-) patients. Various studies indicate that a positive autologous serum test result is indicative of the presence of autoimmunity rather than directly indicative of autoimmune urticaria. However, additional investigations are required to determine the sensitivity and specificity of the autologous serum test as an indicator for the presence of autoantibodies¹³. Hence, a positive test is suggestive but not diagnostic often of autoimmune urticaria. Confirmation is needed by in vitro testing of the patient's serum for anti- FcεRIα or anti- IgE autoantibodies.¹⁴

Table 1: Comparison of results of Autologous serum skin test (ASST) with previous studies

Author	Bajaj et al ⁷	Godse KV	Staubach et al ⁸	Celen OM et al ⁹	Kocaturk et al ¹⁰	Hayde et al ¹¹	Present Study
ASST (+) patients	49.5% (195)	26.7% (12)	62.5% (35)	53.3% (16)	63% (44)	40.7% (22)	60% (30)
ASST (-) patients	50.5% (199)	73.3% (33)	37.5% (21)	46.7% (14)	37% (26)	59.3% (32)	40% (20)
Total	100% (394)	100% (45)	100% (56)	100% (30)	100% (70)	100% (54)	100% (50)

CONCLUSION

To conclude, autologous serum skin test (ASST) was positive in significant number of patients (60%) in the present study. It can reasonably be used as a predictive clinical test to diagnose autoimmune urticaria, especially in situations where the basophil histamine-releasing test is not available. From management aspect of view, in ASST positive patients immunosuppressive therapy may be started if conventional line of management have failed.

Limitations of our study:

- It was uncontrolled and unblinded in nature
- It was not placebo controlled study

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