



**AUTOLOGOUS SERUM SKIN TEST AND SERUM ANTITHYROID  
ANTIBODIES IN PATIENTS WITH CHRONIC  
IDIOPATHIC URTICARIA**

**\*Dr. Sushma Chowdary Kosaraju**

\*Assistant Professor, Department of Dermatology, NRI Medical College & General Hospital,  
Chinakakani, Mangalagiri Mandal, Guntur District, Andhra Pradesh – 522 503.

Article Received on 24/07/2015

Article Revised on 14/08/2015

Article Accepted on 07/09/2015

**\*Correspondence for  
Author**

**Dr. Sushma Chowdary  
Kosaraju**

Assistant Professor,  
Department of  
Dermatology, NRI Medical  
College & General  
Hospital, Chinakakani,  
Mangalagiri Mandal,  
Guntur District, Andhra  
Pradesh – 522 503.

**ABSTRACT**

**Background:** About 25%-45% of chronic idiopathic urticaria (CIU) patients have circulating histamine releasing autoantibodies against the high affinity IgE receptor  $F_{c\epsilon R1\alpha}$  on basophils and mast cells or, less commonly, antibodies to IgE. The term autoimmune urticaria is increasingly being accepted for this subgroup of patients. Autoimmune urticaria (AIU) has no distinctive diagnostic clinical features. Autologous serum skin test (ASST) detects AIU. **Aim:** To find out incidence of autoimmune urticaria among cases of CIU patients by using ASST. To find out proportion of ASST positive CIU patients with elevated thyroid autoantibodies. **Methods:** We conducted a

prospective study in 137 CIU patients who satisfy inclusion / exclusion criteria after written informed consent. In these patients ASST, serum T3/T4/TSH levels, antithyroid antibody levels were done. **Discussion:** Out of 137 patients with chronic idiopathic urticaria, 63(45.9%) showed a positive reaction to the autologous serum skin test. Antithyroid antibodies were found in 46% and thyroid dysfunction in 40.5% in ASST positive patients tested. **Conclusion:** Our study did not show any significant difference between patients with and without antibodies regarding mean age and sex distribution, median duration of disease, simple dermographism and history of atopy. There was a trend towards correlation between ASST positivity and autoimmune thyroid disease, which needs to be confirmed with a larger study.

**KEYWORDS:** Autologous serum skin test, Chronic idiopathic urticaria, Antithyroid antibodies.

## INTRODUCTION

Chronic idiopathic urticaria (CIU) is defined as widespread, short-lived (lasting < 24 hours) wheals occurring daily or almost daily for at least 6 weeks and where a predominant physical cause has been excluded. About 25%-45% of CIU patients have circulating histamine releasing autoantibodies against the high affinity IgE receptor  $F_{c}\epsilon R_{1}\alpha$  on basophils and mast cells or, less commonly, antibodies to IgE. The term autoimmune urticaria (AIU) is increasingly being accepted for this subgroup of patients. AIU has no distinctive diagnostic clinical features. The only in vivo, simple and best screening test for AIU is ASST with a sensitivity and specificity of 65-81% and 71-78% respectively.<sup>[1]</sup> The confirmatory diagnostic tests include basophil CD63 expression assay and basophil histamine release assay which remains confined to research centers.

Autoimmune urticaria in some patients may be associated with systemic autoimmune disorders, commonly Hashimoto's thyroiditis.

## METHODS

137 patients of chronic idiopathic urticaria were included in the study after obtaining informed consent. Patients who were < 12 years of age, pregnant / lactating females were excluded from the study. Patients having acute urticaria, physical urticaria, urticarial vasculitis (diagnosed on the basis of history / provocation tests) or other systemic diseases known to cause urticaria were also excluded. An ASST was performed after the patient was off antihistamines for 3 days (7 days for long acting antihistamines), corticosteroids or immunosuppressive agents for 6 weeks to three months. The test was performed by injecting intradermally 0.05 ml of the patient's own serum and 0.05 ml of 0.9% saline as control separately into the flexor surface of the forearm with 27 G needle with gaps of at least 3 cm between injection sites. A reading of the wheal was taken after 30 minutes. A wheal and flare of more than 1.5 mm diameter than that of the control was considered positive. Areas known to have been involved in spontaneous wheals in the past 24 hours were avoided.

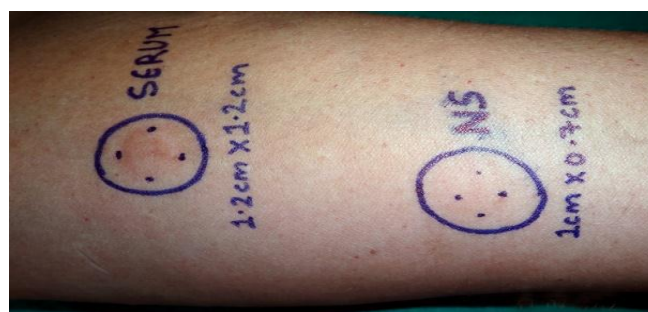


Figure 1: A positive autologous serum skin test

Randomly selected patients were tested for thyroid function test and thyroid autoantibodies viz., antithyroglobulin (TGA) and antimicrobial antibodies (TMA).

## RESULTS

Age, sex, duration of urticaria, dermographism, history of atopy recorded were analyzed in relation to the ASST results. Of the 137 patients, 99 were females and 38 were males aged between 12 and 60 (mean, 33.6) years. ASST was positive in 63 (45.9%) and negative in the other 74 (54.1%) patients. The median duration was 18 and 12 months in ASST positive and ASST negative groups, respectively. Test for simple dermographism was positive in 38 (27.7%) of which 15 were in ASST positive group and 23 from ASST negative group. A positive history of atopy was recorded in 29 (21%) of the total patients, with 15 and 14 patients each from ASST positive and negative groups respectively. Abnormal TFT was obtained in 15 of 45 patients tested, all belonging to the ASST positive group. None of the 8 ASST negative patients tested had abnormal TFT. Of the 15 patients with thyroid dysfunction, 14 were hypothyroid and one was hyperthyroid. Of the 26 ASST positive CIU patients investigated for antithyroid antibodies, 12 showed positivity.

**Table 1: Thyroid function tests and antithyroid antibodies in ASST positive patients**

TFT	Antithyroid antibodies			
	Antithyroglobulin positive	Antimicrobial antibodies positive	Both antithyroglobulin and antimicrobial antibodies positive	Antithyroid antibodies negative
Normal	1	2	2	14
Hypothyroid	1	1	4	0
Hyperthyroid	0	1	0	0

## DISCUSSION

The present study has evaluated 137 patients with chronic idiopathic urticaria (CIU) for the presence of autoantibodies in their sera by autologous serum skin testing. We also tried to find out the proportion of ASST positive CIU patients with elevated thyroid autoantibodies.

The proportion of patients with CIU who showed a positive reaction to ASST was 45.9%. A positive test is suggestive but not diagnostic of an autoimmune basis for patient's urticaria. Sabroe *et al.* found evidence of functional autoantibodies in 31% of 107 patients with chronic urticaria.<sup>[2]</sup> Asero *et al.* found 67% of their CIU patients to be ASST positive,<sup>[3]</sup> The various Indian studies by Godse KV,<sup>[4]</sup> Mamata G *et al.*<sup>[5]</sup> AK Bajaj *et al.*<sup>[6]</sup> Krupa Shankar *et al.*<sup>[7]</sup>

Vohra et al<sup>[8]</sup> and Vikram kumar AG et al<sup>[9]</sup> showed ASST positivity ranging from 26% to 51%.

In our study, there was no difference in age distribution between ASST-positive and negative groups. The mean age of patients in our study was 33.6 years and age ranged from 12 -60 years.

In our study of 137 patients, 99 (72.3%) were females and 38 (27.7%) were males. This finding concurs with the female preponderance in CIU found in other studies.<sup>[10]</sup>

The median duration of disease was 18 and 12 months for ASST-positive and -negative patients respectively, which was not statistically significant compared to the previous study by Sabroe et al.

An exaggerated form of the triple response of Lewis is known as simple dermatographism. Simple dermatographism usually develops within five minutes of stroking the skin and persist for 15 – 30 min in contrast to the normal triple response of Lewis that subsides in less than 5 – 10 min. Simple dermatographism is seen in 4 – 5 % of the normal population. Its prevalence in CIU is reported to be 22%.

In our study, of the total 137 patients, 38 patients showed a positive response to test for simple dermatographism of which 15 were in ASST positive group and 23 from ASST negative group. Thus 27.7% of the CIU patients showed simple dermatographism, but statistically significant difference in the presence of simple dermatographism was not found among the ASST positive and ASST negative groups. ( $P>0.1$ , Chi-square test) of the total 137 patients in our study, 29 (21.2%) patients gave a positive history of atopy. Of the 63 ASST positive patients 15 (23.8%) were atopics. This was consistent with other studies.<sup>[11]</sup>

These results of our study are similar to the study done by Caproni M et al who didn't find any significant differences between the two groups (ASST positive and negative) with regard to mean age, sex distribution and history of atopy.<sup>[12]</sup>

#### **CIU and Thyroid autoimmunity (Thy- AI)**

In one of the earliest studies Leznoff A et al, found thyroid autoimmunity in 12.1% of the 140 CIU patients.<sup>[13]</sup> In a larger study later done by them 90 / 624 CIU patients showed thyroid

autoimmunity.<sup>[14]</sup> Awareness of the association actually resulted in the identification of previously undiagnosed thyroid disease.

Cebeci. FR et al, compared the frequency of thyroid autoantibodies in 140 CIU patients with 181 age- and sex matched volunteers. The frequency of thyroid autoantibodies was significantly higher with CIU than that in healthy controls (29.28%/5.52%;  $P < 0.001$ ). Of 41 patients, 10 had thyroid dysfunction.<sup>[15]</sup>

In our study we have tested for thyroid function (TFT) and anti thyroid antibodies (TMA and TGA) in a few patients. The patients among the ASST positive and ASST negative group were randomly selected.

Positive antithyroid antibodies were obtained in 12 of 26 ASST positive patients- 6 of these were hypothyroid, 1 was hyperthyroid and 5 were euthyroid. TFT were done in 37 of the ASST positive group and 8 of the ASST negative group. Abnormal TFT were obtained in 15 of the 45 patients tested. None of the 8 ASST negative patients had abnormal TFT.

Our findings tally with the findings of O Donnell et al who investigated the incidence of thyroid autoimmunity (Thy-AI).<sup>[16]</sup>

**Table 2: Comparison of O Donnell et al study with the present study**

Authors	O Donnell et al	Present study
Study group	182 CIU patients	137 CIU patients
Positive ASST response	90 (49.45%)	63 (45.9%)
Increased TSH levels		
In ASST positive group	13 of 90 (14.44%)	14 of 37 (37.84%)
In ASST negative group	1 of 92 (1.09%)	0 of 8
In the age matched normal population	5%	
Serum antithyroid microsomal antibodies (TMA).		
In ASST positive group	18 of 90 (20%)	10 of 26 (38.46%)
In ASST negative group	4 of 92 (4.34%)	

Recent study by Snehal Balvant Lunge et al showed 33.33% of ASST positive patients having raised antithyroid microsomal antibodies levels.<sup>[17]</sup>

## CONCLUSION

ASST was positive in 45.9% (63/137) patients with CIU, comparable with the available reports of other studies. There was female preponderance in CIU, which was seen in both

ASST positive and negative groups. There was no difference in the age distribution, median duration of disease, presence of simple dermographism and history of atopy between ASST positive CIU patients and ASST negative CIU patients. Antithyroid antibodies were found in 46% and thyroid dysfunction in 40.5% in ASST positive patients. Though our study found a higher incidence of thyroid dysfunction among ASST positive group and detected antithyroid antibodies in a good proportion of ASST positive cases tested, statistical inference could not be made because of an inadequate number of patients tested and lack of control group. This is important because ASST can be employed as a simple and cost effective in-vivo tool for the diagnosis of autoimmune urticaria associated with thyroid autoimmunity.

## REFERENCES

1. Sabroe RA, Grattan CE, Francis DM, Barr RM, Kobza Black A, Greaves MW. The autologous serum skin test: A screening test for autoantibodies in chronic idiopathic urticaria. *Br J Dermatol.*, 1999; 140: 446-52.
2. Sabroe RA, Seed PT, Francis DM, Barr RM, Kobza Black A, Greaves MW. Chronic idiopathic urticaria: Comparison of the clinical features of patients with and without anti FCER1 or anti IgE auto antibodies. *J Am Acad Dermatol.*, 1999; 40: 443-50.
3. Asero R, Tedeschi A, Lorini M, et al. Chronic urticaria: novel clinical and serological aspects. *Clin Exp Allergy.*, 2001; 31: 1105-1110.
4. Godse KV. Autologous serum skin test in chronic idiopathic urticaria. *Indian J Dermatol Venereol Leprol.*, 2004; 70: 283-284.
5. George M, Balachandran C, Prabhu S. Chronic idiopathic urticaria: Comparison of clinical features with positive autologous serum skin test. *Indian J Dermatol Venereol Leprol.*, 2008; 74: 105-8.
6. Bajaj AK, Saraswat A, Upadhyay A, Damisetty R, Dhar S. Autologous serum therapy in chronic urticaria: Old wine in a new bottle. *Indian J Dermatol Venereol Leprol.*, 2008; 74: 109-13.
7. Krupa Shankar DS, Ramnane M, Rajouria EA. Etiological approach to chronic urticaria. *Indian J Dermatol.*, 2010; 55: 33-8.
8. Vohra S, Sharma NL, Mahajan VK, Shanker V. Clinicoepidemiologic features of chronic urticaria in patients having positive versus negative autologous serum skin test: A study of 100 Indian patients. *Indian J Dermatol Venereol Leprol.*, 2011; 77: 156-9.

9. Vikramkumar AG, Kuruvila S, Ganguly S. Autologous serum skin test as an indicator of chronic autoimmune urticaria in a tertiary care hospital in South India. *Indian Dermatol Online J.*, 2014; 5(S2): 87-91.
10. Sabroe RA, Seed PT, Francis DM, Barr RM, Kobza Black A, Greaves MW. Chronic idiopathic urticaria: Comparison of the clinical features of patients with ondurthout anti FCER1 or anti IgE auto antibodies. *J Am Acad Dermatol.*, 1999; 40: 443-50.
11. Guttman-Yassky, Emma, et al. "The autologous serum skin test in a cohort of chronic idiopathic urticaria patients compared to respiratory allergy patients and healthy individuals." *Journal of the European Academy of Dermatology and Venereology.*, 2007; 21(1): 35-39.
12. Caproni M, Volpi W, Giomi B, Cardinali C, Antiga E, Melani L, Dagata A, Fabbri P. Chronic idiopathic and chronic autoimmune urticaria: clinical and immunopathological features of 68 subjects. *Acta Derm Venereol.*, 2004; 84: 288-90.