
# A Comparative Study on the Efficacy and Safety of Autologous Serum Therapy versus Azathioprine in the Treatment of Chronic Spontaneous Urticaria at a Tertiary Healthcare Centre in Uttar Pradesh

**Dr. Gavvala Cherishma [1*], Dr. Deepti Saxena [2], Dr. Sundiep Kumar [3], Dr. Rishabh Raj Sharma [4], Mohammad Danish [5]**

[1] Post Graduate Resident (3rd Year), Department of Dermatology, Venereology and Leprology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

[2] Professor & Head, Department of Dermatology, Venereology and Leprology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

[3] Professor, Department of Dermatology, Venereology and Leprology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

[4, 5] Assistant Professor, Department of Dermatology, Venereology and Leprology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

* Corresponding Author: **Dr. Gavvala Cherishma**

## Article Info

**ISSN (online):** 2582-8940
**Volume:** 07
**Issue:** 03
**Received:** 26-05-2026
**Accepted:** 24-06-2026
**Published:** 23-07-2026
**Page No:** 121-126

## Abstract

**Background:** Chronic spontaneous urticaria (CSU) is a common inflammatory dermatosis characterised by recurrent wheals, pruritus, and angioedema persisting for six weeks or longer without an identifiable trigger. A substantial proportion of patients remain symptomatic despite standard antihistamine therapy, necessitating immunomodulatory alternatives such as autologous serum therapy (AST) and azathioprine.

**Objective:** To compare the efficacy and safety of AST and azathioprine in patients with CSU attending a tertiary healthcare centre in Uttar Pradesh.

**Methods:** In this prospective, interventional study, 60 patients with CSU aged 18–60 years were randomly allocated to two groups of 30. Group A received weekly intramuscular autologous serum injections for 9 weeks; Group B received oral azathioprine 50 mg/day for 12 weeks. Disease severity was quantified using the Total Severity Score (TSS) at baseline and at 4, 8, and 12 weeks. Clinical response, autologous serum skin test (ASST) status, antihistamine requirement, and adverse events were recorded.

**Results:** Baseline characteristics were comparable between groups ($p > 0.05$). Mean TSS fell from 13.3 ± 2.1 to 5.6 ± 1.8 in the AST group (57.8% reduction) and from 14.2 ± 1.9 to 3.4 ± 1.6 in the azathioprine group (76.1% reduction) at 12 weeks ($p < 0.001$). Total response rate was 73.3% with AST versus 83.4% with azathioprine, with complete remission in 23.3% and 46.7% of patients respectively ($p = 0.038$). ASST-positive status, shorter disease duration, absence of angioedema, younger age, and female sex were associated with better outcomes. Both therapies were well tolerated; no serious adverse events or treatment discontinuations occurred.

**Conclusion:** Azathioprine produced faster and more complete symptom control, whereas AST offered a safe, low-cost, minimally invasive alternative with a simpler monitoring burden. Treatment selection in CSU should be individualised according to disease severity, ASST status, comorbidity, and resource availability.

**DOI:** https://doi.org/10.54660/IJMBHR.2026.7.3.121-126

**Keywords:** Chronic spontaneous urticaria, Autologous serum therapy, Azathioprine, Total severity score, Autologous serum skin test

## 1. Introduction

Chronic spontaneous urticaria (CSU) is a long-standing inflammatory skin disorder characterised by the recurrent appearance of transient, pruritic, erythematous wheals, angioedema, or both, lasting six weeks or more without an identifiable provoking factor. The condition, formerly labelled "chronic idiopathic urticaria," is now recognised to have an autoimmune basis in a substantial subset of patients, driven either by IgE autoantibodies against self-antigens (type I, auto-allergic CSU) or by IgG autoantibodies

against the high-affinity IgE receptor or IgE itself (type IIb, autoimmune CSU) [1, 4]. Mast cell and basophil degranulation, with release of histamine and pro-inflammatory cytokines such as IL-6 and TNF-α, underlies the characteristic wheal-and-flare response [4, 5].

CSU affects approximately 0.5–1% of the general population at any given time, shows a marked female preponderance (female-to-male ratio approaching 2:1), and predominantly affects adults in the third to fifth decades of life [7, 8]. Beyond its cutaneous manifestations, CSU carries a considerable psychosocial and economic burden through sleep disturbance, anxiety, reduced work productivity, and recurring healthcare costs, an impact that is magnified in resource-constrained settings such as Uttar Pradesh, where many patients bear treatment costs directly and access to advanced biologic therapy remains limited [3,7,10].

International guidelines recommend a stepwise approach to CSU management, beginning with standard-dose non-sedating antihistamines and escalating through updosing, omalizumab, and cyclosporine [9]. Despite this algorithm, 15–20% of patients remain symptomatic, constituting the antihistamine-refractory subgroup for whom additional immunomodulation is required [9,11]. Azathioprine, a purine analogue that inhibits proliferation of activated T and B lymphocytes, has demonstrated efficacy in refractory CSU but requires regular haematological and hepatic monitoring because of risks of myelosuppression, hepatotoxicity, and gastrointestinal intolerance [11].

Autologous serum therapy (AST) has emerged as a cost-effective, minimally invasive alternative, based on the principle that repeated intramuscular administration of a patient's own serum promotes immune tolerance — through enhanced T-regulatory activity, suppression of autoreactive B cells, and stabilisation of mast cells and basophils — thereby reducing histamine release and disease activity [12,13,14]. Patients who test positive on the autologous serum skin test (ASST), indicating an autoimmune aetiology, tend to derive greater benefit from AST [15,16,17].

Although both azathioprine and AST target the autoimmune component of CSU, they act through distinct mechanisms, and head-to-head comparative data from Indian tertiary care settings remain scarce [25]. This study was undertaken to directly compare the efficacy, safety, and clinical predictors of response of AST and azathioprine in patients with CSU attending a tertiary healthcare centre in Uttar Pradesh.

### 1.1. Aim and Objectives

**Aim:** To compare the efficacy and safety of autologous serum therapy versus azathioprine in the treatment of chronic spontaneous urticaria at a tertiary healthcare centre in Uttar Pradesh.

**Objectives:** (1) To study the efficacy and safety of autologous serum therapy in CSU; (2) To study the efficacy and safety of azathioprine in CSU; (3) To compare the two treatment modalities on the basis of clinical improvement.

## 2. Materials and Methods

This prospective, interventional study was conducted in the Department of Dermatology, Venereology and Leprology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, over a two-year period from March 2024 to February 2026. A total of 60 patients aged 18–60 years with clinically diagnosed chronic spontaneous urticaria (CSU) attending the dermatology outpatient department were enrolled after obtaining written informed consent. Patients with CSU of at least six weeks' duration who were willing to receive weekly injections and had baseline laboratory investigations within normal limits were included in the study. Patients who were pregnant or lactating, had severe systemic illness, active infections (tuberculosis, hepatitis B, hepatitis C, or HIV), known malignancy, or were receiving anticoagulants, systemic corticosteroids, or other immunosuppressive therapy were excluded.

Sample size was calculated using the formula $n = Z^2 \times p \times q / e^2$, based on an estimated CSU prevalence of 1.5% [12], a 95% confidence interval (Z = 1.96), and an allowable error of 3%, yielding a minimum of 23 patients; 60 patients were enrolled, with 30 in each arm.

Diagnosis was established on clinical history and examination. Baseline work-up included complete haemogram, liver and renal function tests, random blood sugar, absolute eosinophil count, ESR, serum IgE, ASST, serology for HIV and hepatitis B/C, Mantoux test, and chest radiography. Patients were randomly allocated to one of two groups after calculation of baseline Total Severity Score (TSS). Group A (n = 30) received 2 mL of autologous serum as a deep intramuscular injection weekly for 9 weeks. Group B (n = 30) received oral azathioprine 50 mg/day for 12 weeks, with complete blood counts every 2 weeks and liver function tests every 4 weeks, since TPMT testing was unavailable. Rescue levocetirizine (5–10 mg/day) was permitted in both groups; no other drugs were allowed.

Response was assessed by clinical examination, photographic comparison, and repeat TSS scoring at each follow-up (weekly to 12 weeks for Group A after the injection course, and every 2 weeks for Group B). TSS incorporates number and size of wheals, pruritus intensity, duration of persistence, and frequency of attacks and antihistamine use, each graded 0–3 (clear: 0; mild: 1–6; moderate: 7–12; severe: 13–18). Data were analysed in SPSS version 29.0; continuous variables were expressed as mean ± SD and compared using the t-test, while categorical variables were expressed as proportions and compared using the chi-square test. A p value $< 0.05$ was considered statistically significant.

## 3. Results

A total of 60 patients completed the study, 30 in each group. The majority (35%) belonged to the 36–45-year age group, and females constituted 63.3% of the cohort (female-to-male ratio 1.7:1). Baseline demographic and clinical characteristics were comparable between the two groups (Table 1).

**Table 1:** Baseline demographic and clinical characteristics

| Parameter | AST group (n=30) | Azathioprine group (n=30) | p value |
|---|---|---|---|
| Mean age (years) | 35.6 ± 8.7 | 39.1 ± 10.4 | >0.05 |
| Female sex, n (%) | 21 (70.0) | 17 (56.7) | >0.05 |
| Disease duration (months) | 13.2 ± 4.0 | 15.4 ± 4.6 | >0.05 |
| Angioedema, n (%) | 7 (23.3) | 13 (43.3) | <0.05 |
| ASST positive, n (%) | 15 (50.0) | 18 (60.0) | >0.05 |
| Baseline mean TSS | 13.3 ± 2.1 | 14.2 ± 1.9 | >0.05 |

A progressive, statistically significant reduction in mean TSS occurred in both groups over the 12-week study period, with a significantly greater reduction seen in the azathioprine group from week 4 onward (Table 2).

**Table 2:** Mean Total Severity Score (TSS) at follow-up

| Time point | AST (mean ± SD) | Azathioprine (mean ± SD) | p value |
|---|---|---|---|
| Baseline | 13.3 ± 2.1 | 14.2 ± 1.9 | >0.05 |
| 4 weeks | 10.6 ± 2.4 | 9.2 ± 2.1 | <0.05 |
| 8 weeks | 8.0 ± 2.1 | 5.8 ± 1.8 | <0.01 |
| 12 weeks | 5.6 ± 1.8 | 3.4 ± 1.6 | <0.001 |

This corresponded to a 57.8% reduction in TSS with AST and a 76.1% reduction with azathioprine at 12 weeks. The trajectory of improvement in both groups is illustrated in Figure 1.

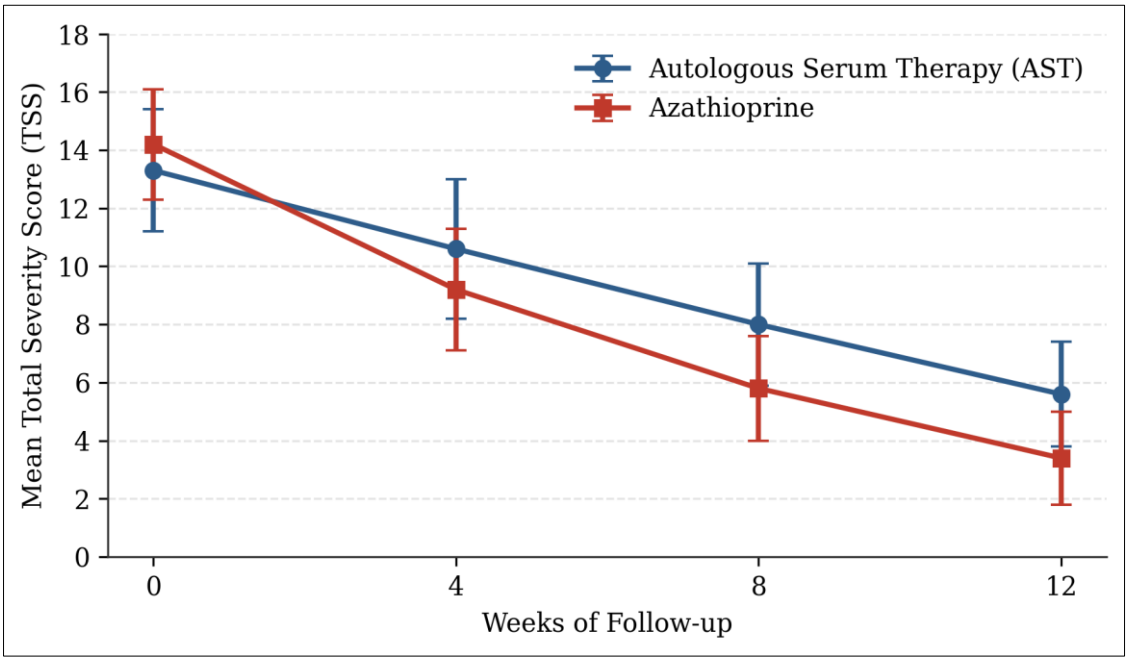


**Fig 1:** Mean Total Severity Score (± SD) at baseline, 4, 8, and 12 weeks in the AST and azathioprine groups.

Clinical response, categorised as complete remission, partial remission, or poor response, was assessed at 12 weeks (Table 3); the overall difference in response between treatments was statistically significant ($\chi^2$, p = 0.038).

**Table 3:** Clinical response at 12 weeks

| Response category | AST, n (%) | Azathioprine, n (%) |
|---|---|---|
| Complete remission | 7 (23.3) | 14 (46.7) |
| Partial remission | 15 (50.0) | 11 (36.7) |
| Poor response | 8 (26.7) | 5 (16.6) |
| Total responders | 22 (73.3) | 25 (83.4) |

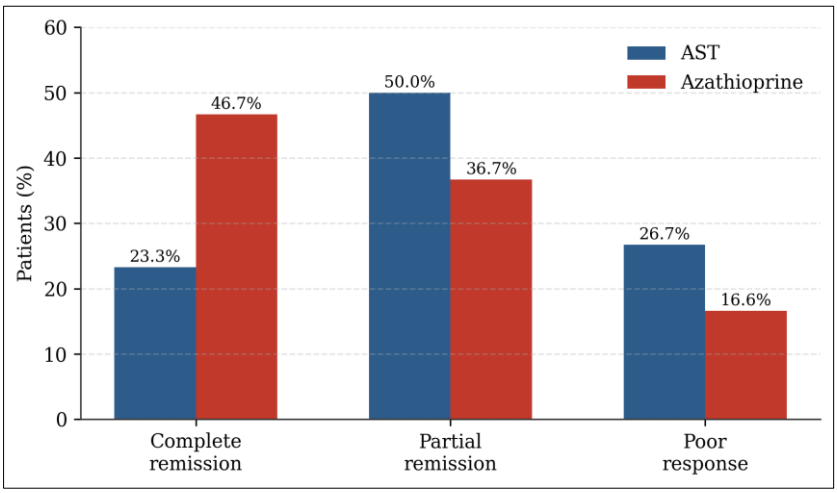


**Fig 2:** Clinical response categories at 12 weeks in the AST and azathioprine groups.

Several baseline factors were significantly associated with a good clinical outcome across both groups combined (Table 4). ASST-positive patients, those with shorter disease duration, absence of angioedema, younger age, and female sex all showed higher rates of good response. A strong positive correlation was found between baseline TSS and percentage reduction in severity ($r = 0.61$, $p < 0.001$), and a moderate negative correlation between disease duration and percentage improvement ($r = –0.46$, $p = 0.002$).

**Table 4:** Factors associated with clinical response (both groups combined, n = 60)

| Factor | Good response, n | Poor response, n | p value |
|---|---|---|---|
| ASST positive (n=33) vs negative (n=27) | 28 vs 19 | 5 vs 8 | 0.041 |
| Angioedema absent (n=40) vs present (n=20) | 35 vs 12 | 5 vs 8 | 0.009 |
| Disease duration <1 yr (n=23) vs ≥1 yr (n=37) | 20 vs 27 | 3 vs 10 | — |
| Age <40 yr (n=34) vs ≥40 yr (n=26) | 29 vs 18 | 5 vs 8 | 0.036 |
| Female (n=38) vs male (n=22) | 32 vs 15 | 6 vs 7 | 0.048 |

Both therapies significantly reduced rescue antihistamine use: users fell from 100% at baseline to 40.0% at 12 weeks in the AST group and to 23.3% in the azathioprine group (both $p < 0.001$). Adverse events were mild in both groups, with no serious adverse events or treatment discontinuations (Table 5).

**Table 5:** Adverse effects

| Adverse effect | AST group, n | Azathioprine group, n |
|---|---|---|
| Injection site pain | 3 | 0 |
| Fever / malaise | 2 | 0 |
| Nausea | 0 | 4 |
| Leukopenia | 0 | 2 |
| Raised liver function tests | 0 | 1 |
| Treatment discontinued | 0 | 0 |

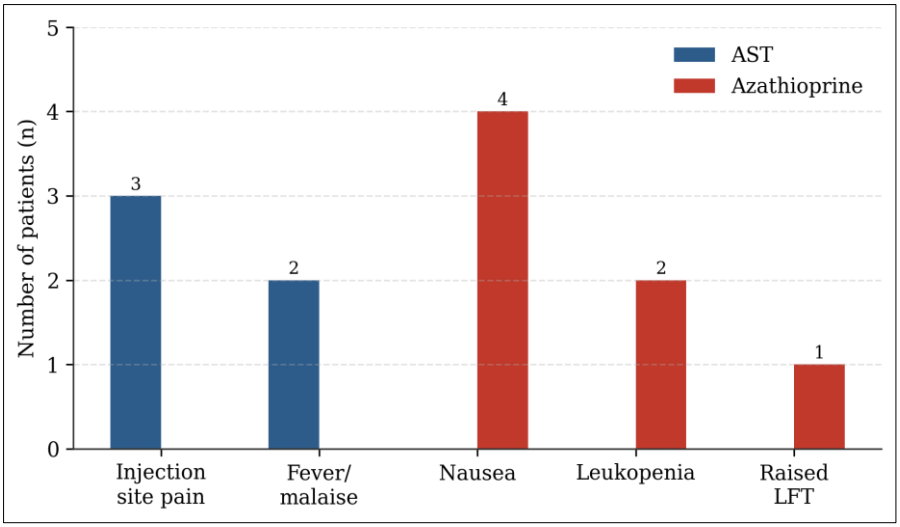


**Fig 3:** Comparison of adverse effects reported in the AST and azathioprine groups.

## 4. Discussion

This comparative study evaluated AST and azathioprine in patients with CSU attending a tertiary healthcare centre in Uttar Pradesh. The predominance of patients in the 36–45-year age group and the female preponderance observed here (63.3%, female-to-male ratio 1.7:1) are consistent with earlier epidemiological reports describing CSU as a disease of young to middle-aged adults with a female-to-male ratio approaching 2:1, attributed in part to hormonal influences and greater susceptibility to autoimmune disease [1,3,7,8].

Both groups were well matched at baseline for disease duration, ASST positivity, and TSS. The overall ASST-positivity rate of 55% in this cohort falls within the 40–60% range reported in earlier series, supporting a substantial autoimmune contribution to CSU in this population [16,17]. Disease duration in our cohort (13–15 months) was shorter than the 1–5-year range typically cited in the literature, which may partly explain the relatively favourable overall response rates observed with both therapies [10].

Azathioprine produced a significantly greater and faster reduction in TSS than AST, with a 76.1% versus 57.8% reduction at 12 weeks and higher rates of complete remission (46.7% versus 23.3%). This pattern mirrors previous reports of azathioprine efficacy in ASST-positive, antihistamine-refractory CSU [19,20], while the AST response rate observed here is broadly comparable to, if slightly lower than, that reported by Bajaj *et al*. and by other AST cohorts, a difference likely attributable to variation in treatment duration, patient selection, and baseline severity [12,21].

ASST positivity emerged as a significant predictor of good response in this study (84.8% of ASST-positive versus 70.3% of ASST-negative patients), consistent with earlier work demonstrating that AST is preferentially effective in patients with autoimmune, ASST-positive disease [21,22]. Similarly, shorter disease duration, absence of angioedema, younger age, and female sex were each associated with better outcomes, in line with observations that longer-standing disease and angioedema reflect more entrenched immune dysregulation and greater treatment resistance [6,23].

Both treatments reduced dependence on rescue antihistamines, with a greater reduction seen with azathioprine, echoing earlier reports of substantial antihistamine-sparing effects with AST [24]. Adverse effects in both arms were mild, self-limiting, and did not necessitate discontinuation — injection-site discomfort and transient malaise with AST, and nausea, leukopenia, and mild transaminase elevation with azathioprine — broadly consistent with previously reported safety profiles for both agents [11,18]. The strong positive correlation between baseline severity and percentage improvement ($r = 0.61$) suggests that patients presenting with more severe disease have proportionally greater room, and capacity, for improvement, a pattern noted in other CSU treatment cohorts [13].

Taken together, these findings suggest that while azathioprine offers superior and more rapid disease control, AST remains clinically valuable because of its low cost, minimal invasiveness, and modest monitoring requirements, particularly relevant in resource-constrained tertiary care settings where systemic immunosuppression or biologic therapy may not be feasible for every patient [25]. Treatment choice should therefore be individualised, taking into account disease severity, ASST status, comorbidity, and the patient's capacity for monitoring and follow-up.

This study's strengths include its head-to-head comparative design and the systematic evaluation of prognostic factors including ASST status, disease duration, and angioedema. Limitations include a moderate sample size, a relatively short 12-week follow-up, and the absence of a formal quality-of-life instrument such as the Dermatology Life Quality Index. Larger, multicentric studies with longer follow-up and quality-of-life assessment are needed to clarify long-term efficacy, relapse rates, and the durability of response with both modalities.

## 5. Conclusion

Both autologous serum therapy and azathioprine are effective and generally well-tolerated treatment options for chronic spontaneous urticaria. Azathioprine achieved a faster and greater reduction in disease severity and a higher complete remission rate, while AST provided a safe, low-cost, and minimally invasive alternative with fewer monitoring requirements. ASST-positive status, shorter disease duration, absence of angioedema, younger age, and female sex were associated with a better clinical response to either therapy. Individualised treatment selection, guided by disease severity, ASST status, comorbidity, and resource availability, remains essential for optimal management of CSU, and larger multicentric trials with longer follow-up are warranted to confirm these findings.

## References


1. Kolkhir P, Church MK, Weller K, Metz M, Schmetzer O, Maurer M. Autoimmune chronic spontaneous urticaria: what we know and what we do not know. J Allergy Clin Immunol. 2017;139(6):1772-81.
2. Caffarelli C, Cuomo B, Cardinale F, Barberi S, Dascola CP, Agostinis F, *et al*. Aetiological factors associated with chronic urticaria in children: a systematic review. Acta Derm Venereol. 2013;93:268-72.
3. Ben-Shoshan M, Blinderman I, Raz A. Psychosocial factors and chronic spontaneous urticaria: a systematic review. Allergy. 2013;68(2):131-41.
4. Kaplan A, Lebwohl M, Giménez-Arnau AM, Hide M, Armstrong AW, Maurer M. Chronic spontaneous urticaria: focus on pathophysiology to unlock treatment advances. Allergy. 2023;78(2):389-401.
5. Saini SS. Chronic spontaneous urticaria: etiology and pathogenesis. Immunol Allergy Clin North Am. 2014;34(1):33-52.
6. Saini SS, Asero R, Cugno M, Park HS, Oliver ET. Pathogenesis of chronic spontaneous urticaria with or without angioedema. J Allergy Clin Immunol Pract. 2025;13(9):2221-8.
7. Gonçalo M, Gimenéz-Arnau A, Al-Ahmad M, Ben-Shoshan M, Bernstein JA, Ensina LF, *et al*. The global burden of chronic urticaria for the patient and society. Br J Dermatol. 2021;184(2):226-36.
8. Soong W, Patil D, Rodrigues J, Kohli RK, Krupsky K, Gupta S, *et al*. Clinical profile, prevalence, and burden of chronic spontaneous urticaria in the United States. World Allergy Organ J. 2025;18(8):101081.
9. Zuberbier T, Abdul Latiff AH, Abuzakouk M, Aquilina S, Asero R, Baker D, *et al*. The international EAACI/GA²LEN/EuroGuiDerm/APAAACI guideline for the definition, classification, diagnosis, and management of urticaria. Allergy. 2022;77:734-66.
10. Riedl MA, Patil D, Rodrigues J, Kuruvilla M, Raftery T,

Pivneva I, *et al*. Clinical burden, treatment, and disease control in patients with chronic spontaneous urticaria: real-world evidence. Ann Allergy Asthma Immunol. 2025;134(3):324-32.
11. Johal KJ, Saini SS. Current and emerging treatments for chronic spontaneous urticaria. Ann Allergy Asthma Immunol. 2020;125(4):380-7.
12. 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(2):109-13.
13. Yu L, Buttgereit T, Stahl Skov P, Schmetzer O, Scheffel J, Kocatürk E, *et al*. Immunological effects and potential mechanisms of action of autologous serum therapy in chronic spontaneous urticaria. J Eur Acad Dermatol Venereol. 2019;33(9):1747-54.
14. Godse KV, Nadkarni N, Patil S, Mehta A. Subcutaneous autologous serum therapy in chronic spontaneous urticaria. Indian J Dermatol. 2017;62(5):505-7.
15. Konstantinou GN, Asero R, Maurer M, Sabroe RA, Schmid-Grendelmeier P, Grattan CEH. EAACI/GA²LEN task force consensus report: the autologous serum skin test in urticaria. Allergy. 2009;64:1256-68.
16. Baumann K, Marcelino J, Skov PS, Santos MC, Wyroslak I, Scheffel J, *et al*. Autologous serum skin test reactions in chronic spontaneous urticaria differ from heterologous cell reactions. J Eur Acad Dermatol Venereol. 2021;35(6):1338-45.
17. Kumar YH, Bhaskar S, Shankar K. Comparative study of positive versus negative autologous serum skin test in chronic spontaneous urticaria and its treatment outcome. North Am J Med Sci. 2016;8(1):25.
18. Kocatürk E, Aktaş S, Türkoğlu Z, Kavala M, Zindancı I, Koç M, *et al*. Autologous whole blood and autologous serum injections are equally effective as placebo injections in reducing disease activity in patients with chronic spontaneous urticaria: a placebo-controlled, randomized, single-blind study. J Dermatolog Treat. 2012;23(6):465-71.
19. Bhanja DC, Ghoshal L, Das S, Das S, Roy AK. Azathioprine in autologous serum skin test positive chronic urticaria: a case-control study in a tertiary care hospital of eastern India. Indian Dermatol Online J. 2015;6(3):185-8.
20. Tal Y, Toker O, Agmon-Levin N, Shalit M. Azathioprine as a therapeutic alternative for refractory chronic urticaria. Int J Dermatol. 2015;54(3):367-9.
21. Elazab S, Hessam W. The effect of autologous serum therapy in chronic spontaneous urticaria depends on autologous serum skin test positivity. Egypt J Immunol. 2017;24(2):165-72.
22. Valapil AP, Issac CM, Vineetha M. Autologous serum therapy in chronic idiopathic urticaria. J Evid Based Med Healthc. 2020;7(30):1453-8.
23. Wannous BI, Khaddam J, Ismaiel MA. Efficacy of autologous serum therapy in chronic urticaria: a prospective experimental cohort study. Open Dermatol J. 2022;16:e2209260.
24. Mohammed J. Autologous serum therapy reduces the symptoms and antihistamine burden in patients with chronic urticaria. Adv Dermatol Allergol. 2023;40:398-401.
25. Chu A, Oykhman P, Chu X, Rayner D, Bhangal S, Dam A, *et al*. Comparative efficacy and safety of biologics and systemic immunomodulatory treatments for chronic urticaria: systematic review and network meta-analysis. J Allergy Clin Immunol. 2025;156(4):1008-23.

**How to Cite This Article**
Cherishma G, Saxena D, Kumar S, Sharma RR, Danish M. A comparative study on the efficacy and safety of autologous serum therapy versus azathioprine in the treatment of chronic spontaneous urticaria at a tertiary healthcare centre in Uttar Pradesh. Int J Med All Body Health Res. 2026;7(3):121-126. doi:10.54660/IJMBHR.2026.7.3.121-126.