

Cholinergic Urticaria with Complete Remission Following Regular Sauna Bathing: A Case Report

Michał Szklarz¹, Mikołaj Madeksza^{1*}, Wojciech Matuszewski¹

Clinic of Endocrinology and Metabolic Diseases, School of Medicine, Collegium Medicum, University of Warmia and Mazury, 10-957 Olsztyn, Poland

Abstract

BACKGROUND: Cholinergic urticaria (CholU) is a condition characterized by small, highly pruritic wheals triggered by sweating. Treatment with histamine H1-receptor antagonists (H1RAs) is often insufficient.

CASE PRESENTATION: We report the case of a 20-year-old male who developed CholU following a period of physical inactivity with reduced sweating. Symptoms were reproducibly triggered by exercise or emotional stress and were most severe after prolonged inactivity. The patient undertook a self-directed desensitization approach using weekly dry sauna bathing. Over eight weeks, he experienced progressive improvement, with complete resolution of symptoms that was sustained with continued sessions.

CONCLUSION: This case suggests that controlled, repeated sweating may reduce disease activity in selected patients. Sauna bathing may represent a feasible, low-cost, non-pharmacologic adjunct in CholU that warrants further investigation.

Citation: Szklarz M, Madeksza M, Matuszewski W. Cholinergic Urticaria with Complete Remission Following Regular Sauna Bathing: A Case Report. Open Access Maced J Med Sci. 2026 Sep 18; 14(2):60-63. <https://doi.org/10.3889/oamjms.2026.12145>
Keywords: cholinergic urticaria; sweating therapy; sauna bathing; desensitization; sweat hypersensitivity; non-pharmacologic therapy; case report
***Correspondence:** Mikołaj Madeksza.
Clinic of Endocrinology and Metabolic Diseases, School of Medicine, Collegium Medicum, University of Warmia and Mazury, 10-957 Olsztyn, Poland
Email: mikolaj.madeksza@icloud.com
ORCID ID: <https://orcid.org/0009-0005-4793-8711>
Received: 13-Apr-2026
Revised: 11-May-2026
Accepted: 06-Jun-2026
Copyright: © 2026 Michał Szklarz, Mikołaj Madeksza, Wojciech Matuszewski.
License: This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)
Funding: This research did not receive any financial support
Competing Interests: The authors have declared that no competing interests exist

Introduction

Cholinergic urticaria (CholU) is characterized by small, highly pruritic and/or painful wheals triggered by sweating [1], [2]. The reported prevalence ranges from 0.023 to 11.2% [3], and it is the highest in young adults [4], [5]. Although the pathogenesis of CholU is heterogeneous, hypersensitivity to sweat-bound antigens [6], [7] and impaired sweat flow [1] are thought to play a central role in many patients. Standard first-line therapy consists of histamine H1-receptor antagonists (H1RAs) [8]. Treatment responses are frequently incomplete, even with dose escalation or the use of second-line treatments [1].

Given the limited efficacy of available pharmacologic options, nonpharmacologic approaches that target disease mechanisms warrant consideration [1]. Here, we report a case of CholU with marked clinical improvement following regular dry sauna bathing as a form of sweating therapy.

Case Presentation

The patient was a 20-year-old male with vitiligo, autoimmune thyroiditis, and a history of childhood atopic dermatitis. In February 2025, he sustained a shoulder injury and became physically inactive for 6 weeks. Two weeks into this period, he developed recurrent crops of 1–2 mm erythematous papules on the arms, accompanied by erythematous macules on the chest and abdomen. The lesions were consistently triggered by sweating (e.g., during exercise or emotional stress), subsided within approximately 15 minutes, and were highly pruritic. Symptoms progressively worsened over the subsequent weeks of inactivity. Pruritus intensity was quantified using a 0–10 numeric rating scale (NRS), where 0 indicates no pruritus and 10 indicates worst imaginable pruritus, adapted to capture peak itch during each episode [9]. The NRS is a validated, non-proprietary patient-reported outcome measure, and no permission was required for its use [9].

The patient did not report generalized heat intolerance, xerosis, or other features suggestive of acquired idiopathic generalized anhidrosis (AIGA). Sweating was reduced during the period of inactivity but not absent. No formal testing for sweat hypersensitivity or quantitative sudomotor function was performed. In April 2025, CholU was diagnosed based on the clinical presentation and a positive exercise provocation test.

Treatment with an H1RA was prescribed. However, the patient noted a diurnal variation in symptom severity, with more pronounced symptoms in the morning (after overnight inactivity) and partial attenuation following repeated sweating episodes. Based on this observation, pharmacologic treatment was not initiated, and the patient undertook a self-directed desensitization approach using sauna bathing.

The patient attended a local public dry (Finnish) sauna once weekly, with a temperature of approximately 100°C. Each session consisted of a single continuous exposure. Prior to entering the sauna, the patient ensured adequate hydration and took a shower at ambient temperature. Exposure continued until pruritus became difficult to tolerate (approximately ≥ 7 on the NRS), at which point the session was terminated. Cooling consisted of seated rest with oral hydration; no cold immersion was used.

Exposure duration increased progressively: initial sessions lasted only a few minutes due to severe pruritus but increased to 15 minutes by week 4. From weeks 5–8, the patient was able to complete 15-minute sessions with progressively reduced symptom intensity. CR in daily life after 8 weeks. Longitudinal

changes in pruritus intensity and wheal severity are summarized in Table 1.

Table 1: Changes in pruritus and wheal severity during weekly sauna therapy

Week	Duration (min)	Peak pruritus (NRS 0–10)	Wheal severity
1	3–5	9–10	Generalized (trunk and upper limbs)
2	5–8	8–9	Generalized
3	8–12	7–8	Moderate, widespread
4	15	~7	Moderate
5	15	~6	Mild to moderate
6	15	~5	Mild
7	15	≤ 5	Mild, localized
8	15	≤ 4	Mild, minimal
12+	15	0–2	None or occasional minimal

Notes: Peak pruritus refers to the maximum intensity experienced during each sauna session. Wheal severity was assessed qualitatively based on extent and distribution of lesions. Abbreviations: NRS, numeric rating scale.

Discussion

Sweating therapy as a treatment of CholU

A desensitizing effect is frequently observed in CholU, whereby symptoms diminish with repeated sweating [1]. Consistent with this phenomenon, several reports have described clinical improvement following regular sweating induced by exercise, hot bathing, or structured desensitization protocols (Table 2). Proposed mechanisms include gradual tolerance to sweat-associated antigens [1], [7] and restoration of sweat flow through eccrine ducts obstructed by keratinous plugs [1], [10], [11].

Table 2: Summary of available reports of desensitization treatment of CholU

Publication	N; N female	Mean age	Desensitization method	Desensitization period	Study design	Results
Tanaka et al. 2007 [12]	1; 0	24.0	1x/week intradermal injection of partially purified sweat antigen	NA	The patient underwent the intervention	Gradual improvement of symptoms
Kozaru et al. 2011 [13]	6; 6	27.8	1x/week intradermal injection of autologous diluted sweat	2–12 months	All patients had a strong hypersensitivity to sweat and underwent the desensitization	Intensity and frequency of symptoms decreased in 5 patients
Kim et al. 2015 [14]	2; NA	NA	Exercise	NA	Retrospective analysis of 18 patients with cholU	This study mentioned that 2 patients with sweat allergy type cholU experienced symptom relief by repeated exercise-induced sweating
Minowa et al. 2020 [10]	27; 6	30.3	Cardiovascular exercise or hot bathing	1–23 months	Group A: sweat-inducing activities with or without pharmacological treatment, Group B: only pharmacological treatment	Group A: CR in 67%, PR in 25%, poor response in 8% Group B: CR in 7%, PR in 53%, poor response in 40%
Takahagi et al. 2022 [15]	30; 1	NA	Exercise or hot bathing	NA	Retrospective analysis of patients with sweating-induced dermal pain	Symptoms occurred after discontinuing sweat-inducing activity in 20 (67%) patients, Regular sweating activity reduced dermal pain in 6/10 patients
Kubaisi 2023 [2]	240; 87	25.5	1x/day 30 minutes cardiovascular exercise	2 weeks	Group A: H1RA only, Group B: exercise + H1RA, Group C: exercise + placebo	Disease activity decreased significantly in all groups, Significantly better outcomes in group b compared to groups a and c
Yoshida et al. 2024 [16]	8; 1	23.9	1x/day 30–60 minutes hot bath (40–43°C)	3–7 days	All patients underwent the intervention	Pain improved in 3 (38%) patients, urticaria improved in 4 (50%) patients, anhidrosis improved in 5 patients (63%)
Szklarz et al 2026 (current work)	1; 0	20.0	1x/week 15 minutes dry sauna (100°C)	8 weeks	The patient underwent the intervention	CR in daily life after 8 weeks

Abbreviations: CR, complete remission; CholU, cholinergic urticaria; H1RA, H1 receptor antagonists; PR, partial response; NA, data not available.

To our knowledge, this is the first report describing treatment of CholU using sauna bathing as

a primary sweating modality. Sauna bathing provides controlled and reproducible heat exposure, allowing

induction of sweating independent of physical fitness. In this patient, weekly sauna sessions were associated with a rapid and sustained improvement, supporting the role of regular sweating in modulating disease activity in selected patients.

Safety precautions of sweating therapy

Despite safety concerns surrounding desensitization protocols, sweating-based interventions appear well tolerated when appropriate precautions are observed. Patients should be instructed to discontinue sweating activities if significant discomfort occurs, and regimens should be carefully titrated, particularly in those with extracutaneous manifestations [16]. Measures to prevent overheating are also important, especially in individuals with impaired sweating function. To date, no serious adverse events have been reported in published studies of sweating-based desensitization for CholU [2], [10], [12], [13], [14], [15], [16], and no adverse events were observed in the present case.

Cessation of sweat-inducing activities as a triggering factor for CholU

Reduced or absent sweating has been proposed as a contributing factor in some patients with CholU. In a case series by Takahagi et al., a substantial proportion of patients developed symptoms following discontinuation of regular sweating [15]. Seasonal exacerbation during colder months, when sweating is reduced, has also been described [2], [10], [11], [15]. Reduced sweating may promote poral occlusion, a mechanism implicated in disease pathophysiology, and may identify patients who respond particularly well to sweating-based interventions [10].

In the present case, symptom onset followed a period of physical inactivity, and marked improvement occurred after reintroduction of regular sweating through sauna bathing, supporting this proposed relationship.

Conclusion

This case describes CholU onset following reduced sweating and complete remission after regular dry sauna bathing. While causality cannot be inferred from a single case, these findings support existing evidence that controlled, repeated sweating may reduce disease activity in selected patients. Given the limited efficacy of current pharmacologic treatments, sauna-based sweating therapy may represent a simple, non-pharmacologic adjunct. Beyond symptom control, reframing sweating as therapeutic rather than harmful may reduce avoidance behaviors and support long-term disease control. These findings warrant further evaluation in controlled studies.

Author Contributions

M.S., M.M.: literature search, creation of tables, drafting the manuscript; W.M.: conceptualization, data curation, and validation. All authors contributed to the review and editing. All authors have read and agreed to the published version of the manuscript.

Informed Consent Statement

The patient has given his written informed consent to the publication of his case.

Ethical Approval

Ethical approval was not required for this case report in accordance with institutional policies, as this study describes a retrospective report of a self-initiated intervention. Written informed consent was obtained from the patient for publication.

Data Availability Statement

All relevant data supporting this case report are included in the article.

Acknowledgments

We thank the patient, whose written consent was obtained and who kindly agreed to co-operate with this study.

References

1. Fukunaga A, Oda Y, Imamura S, Mizuno M, Fukumoto T, Washio K: Cholinergic Urticaria: Subtype Classification and Clinical Approach. *Am J Clin Dermatol*. 2023, 24:41-54. <https://doi.org/10.1007/s40257-022-00728-6> PMID:36107396 PMCID:PMC9476404
2. Kubaisi T: Regular sports exercises as a supportive therapeutic choice in cholinergic urticaria. *J Pak Assoc Dermatol*. 2023, 33:1298-305. <https://doi.org/10.66344/jpad.v33i4.2297>
3. Rujitharanawong C, Tuchinda P, Chularojanamontri L, Chanchaemsri N, Kulthanan K: Cholinergic Urticaria: Clinical Presentation and Natural History in a Tropical Country. *BioMed Res Int*. 2020, 2020:7301652. <https://doi.org/10.1155/2020/7301652> PMID:32596363 PMCID:PMC7273400
4. Kim JE, Eun YS, Park YM, et al.: Clinical Characteristics of Cholinergic Urticaria in Korea. *Ann Dermatol*. 2014, 26:189. <https://doi.org/10.5021/ad.2014.26.2.189> PMID:24882973 PMCID:PMC4037671
5. Fukunaga A, Washio K, Hatakeyama M, Oda Y, Ogura K, Horikawa T, Nishigori C: Cholinergic urticaria: epidemiology, physiopathology, new categorization, and management. *Clin Auton Res*. 2018, 28:103-13. <https://doi.org/10.1007/s10286-017-0418-6> PMID:28382552
6. Valenta R, Steiner R, Seiberler S, et al.: Immunoglobulin E Response to Human Proteins in Atopic Patients. *J Invest Dermatol*. 1996, 107:203-8. <https://doi.org/10.1111/1523-1747.ep12329617> PMID:8757763

7. Takahagi S, Tanaka A, Hide M: Sweat allergy. *Allergol Int.* 2018, 67:435-41. <https://doi.org/10.1016/j.alit.2018.07.002> PMID:30075993
8. Magerl M, Altrichter S, Borzova E, et al.: The definition, diagnostic testing, and management of chronic inducible urticarias - The EAACI/GA2 LEN/EDF/UNEV consensus recommendations 2016 update and revision. *Allergy.* 2016, 71:780-802. <https://doi.org/10.1111/all.12884> PMID:26991006
9. Yosipovitch G, Reaney M, Mastey V, et al.: Peak Pruritus Numerical Rating Scale: psychometric validation and responder definition for assessing itch in moderate-to-severe atopic dermatitis. *Br J Dermatol.* 2019, 181:761-9. <https://doi.org/10.1111/bjd.17744> PMID:30729499 PMCID:PMC6850643
10. Minowa T, Sumikawa Y, Kan Y, Kamiya T, Uhara H: Regular sweating activities for the treatment of cholinergic urticaria with or without acquired idiopathic generalized anhidrosis. *Dermatol Ther.* 2020; 33:e13647. <https://doi.org/10.1111/dth.13647> PMID:32445244
11. Rho N-K: Cholinergic Urticaria and Hypohidrosis: A Clinical Reappraisal. *Dermatology.* 2006, 213:357-8. <https://doi.org/10.1159/000096205> PMID:17135748
12. Tanaka T, Ishii K, Suzuki H, Kameyoshi Y, Hide M: Cholinergic urticaria successfully treated by immunotherapy with partially purified sweat antigen [Japanese]. *Arerugi Allergy.* 2007, 56:54-7. PMID:17272959
13. Kozaru T, Fukunaga A, Taguchi K, et al.: Rapid Desensitization with Autologous Sweat in Cholinergic Urticaria. *Allergol Int.* 2011, 60:277-81. <https://doi.org/10.2332/allergolint.10-OA-0269> PMID:21364312
14. Kim JE, Jung KH, Cho HH, Kang H, Park YM, Park HJ, Lee JY: The significance of hypersensitivity to autologous sweat and serum in cholinergic urticaria: cholinergic urticaria may have different subtypes. *Int J Dermatol.* 2015, 54:771-7. <https://doi.org/10.1111/ijd.12549> PMID:25069826
15. Takahagi S, Okamoto M, Ishii K, et al.: Clinical and histological characterization of transient dermal pain triggered by sweating stimuli. *Allergol Int Off J Jpn Soc Allergol.* 2022, 71:362-72. <https://doi.org/10.1016/j.alit.2022.01.003> PMID:35272957
16. Yoshida S, Shiraishi K, Yatsuzuka K, Kohri N, Muto J, Murakami M, Fujisawa Y: Effects of hot bath therapy on cholinergic urticaria with hypohidrosis or anhidrosis. *Eur J Dermatol.* 2024, 34:271-5. <https://doi.org/10.1684/ejd.2024.4677> PMID:39015961