Vol. 37 / No. 2 / August 2025
Sinta 2 (Decree No: 200/M/KPT/2020)
Online ISSN : 2549-4082 ; Print ISSN : 1978-4279
Available online at https://e-journal.unair.ac.id/BIKK

Berkala Ilmu Kesehatan Kulit dan Kelamin

Case Report

Periodical of Dermatology and Venereology

Phototherapy for Treating Chronic Spontaneous Urticaria

Zilpa Widyastuti, Triasari Oktavriana

Departement of Dermatology and Venereology Faculty of Medicine Sebelas Maret University, Dr. Moewardi General Hospital, Surakarta – Indonesia

ABSTRACT

Background: Chronic spontaneous urticaria (CSU) is a disease characterized by the onset of wheals, angioedema and/or both for more than 6 weeks. The clinical characteristics of CSU include wheals and flares that are erythematous or skin- colored. The most frequently used medical therapy is second-generation H1 antihistamines followed by first-generation H1 antihistamines. CSU is currently treated with phototherapy utilizing narrowband ultraviolet B (NB-UVB). **Case Report:** A 36-year-old woman presented to the Dermatology and Venereology Outpatient Clinic of DR. Moewardi Hospital, Surakarta, with itchy reddish bumps all over her body since 6 months ago. A dermatology examination obtained multiple erythematous-based urticaria varying in size on her anterior and posterior trunks. We treated this patient with a combination of antihistamines and NB-UVB phototherapy at 200 mJ/cm^2 weekly for a month. Significant clinical improvement was observed at week 4 of therapy. **Discussion:** In the treatment of chronic spontaneous urticaria, NB-UVB phototherapy serves as an adjuvant therapy. It acts as a suppressor of the systemic immune response which reduces the release of histamines and pro-inflammatory mediators, prevents mast cell apoptosis in the dermis, and regulates Th1 as well as Th2. The dose may start at 200 mJ/cm2 then increase by 10-20% for each visit. The combination of antihistamines and NB-UVB has a significant effect on treating chronic spontaneous urticaria.

Keywords: antihistamines, chronic spontaneous urticaria, phototherapy.

Correspondence: Zilpa Widyastuti, Departement of Dermatology and Venereology Faculty of Medicine Sebelas Maret University, Dr. Moewardi General Hospital, Surakarta, Central Java, Indonesia. Phone: +62 81291876371,
Email: zilpawidyastuti84@gmail.com.

| Article info |
Submited: 06-09-2022, Accepted: 30-04-2024, Published: 31-07-2025

BACKGROUND

Urticaria is a skin disorder characterized by acute edema of the dermis layer (wheals) and may be accompanied by angioedema due to histamine release by mast cells. Based on the time of onset, urticaria is divided into two categories, namely acute and chronic urticaria.[1] Acute urticaria is defined as urticaria that occurs spontaneously without angioedema and lasts less than 6 weeks, whereas chronic urticaria develops urticaria and/or angioedema lasting more than 6 weeks. Angioedema is a transient localized mucosal or skin edema of deep tissue and is mostly accompanied by burning or pain without itching. Urticaria and angioedema can occur simultaneously in one patient, but can also occur separately.[1,2]

The prevalence of chronic spontaneous urticaria worldwide in 2016 was estimated at 0.23-1.8% of cases in the entire population.[3] The incidence of chronic urticaria in Korea in 2017 was reported to be 2,256 cases per 100,000 population per year; this figure is higher than in European countries as well as the United States.[4] There is still no definite data on the prevalence of chronic urticaria in Indonesia until now. In 2010, Wirantari reported new cases of urticaria in 2.3% of all patients at the outpatient clinic of Dermatology and Venereology Department of RSUD Dr. Soetomo Surabaya.[5]

The clinical manifestations of chronic spontaneous urticaria are urticaria and flare-ups with erythema or skin coloration. The three main signs of wheals in urticaria are edema and erythema, an itching or burning

DOI:10.20473/bikk.V37.2.2025.147-152

sensation, and a return to normalcy within 1-24 hours. Some examples of chronic spontaneous urticarial skin disorders that occur include erythematous or pale plaques with or without angioedema, annular urticarial plaques, and multiple papules that coalesce in certain regions. Urticaria and angioedema can occur simultaneously or at different locations. Angioedema generally occurs in the facial area, especially the folds of the eyes and lips.[6]

The clinical picture of chronic spontaneous urticaria may resemble autoimmune chronic urticaria or induced chronic urticaria. Clinical symptoms of chronic autoimmune urticaria generally include itching, atopic stigmata, wheals, and comorbidities such as autoimmune diseases. Wheals and angioedema in chronic urticaria may occur as a result of exposure to cold temperatures, as skin lesions are generally confined to the area of contact.[7,8]

The main management strategy of patients with chronic spontaneous urticaria is to identify and avoid precipitating factors. The recommended medical therapy is a second-class of H1 antihistamine and/or a first-class of H1 antihistamine.[9] Some cases that are resistant to treatment with antihistamines may be considered using corticosteroids, cyclosporine, or omalizumab.[10] Suggested adjunct therapy in patients with chronic spontaneous urticaria is the use of phototherapy. Phototherapy is divided into single phototherapy, combination phototherapy, or photochemotherapy. Single phototherapy is UV irradiation therapy on the body surface using a single modality, while combination phototherapy, or photochemotherapy, is a combination of UV radiation irradiation with a photosensitizer such as psoralen. The phototherapy option for patients with chronic spontaneous urticaria is narrowband UVB (NB- UVB). Narrowband ultraviolet B (NB-UVB) phototherapy acts as a suppressor of the systemic immune response, reduces the release of histamine and proinflammatory mediators, prevents mast cell apoptosis in the dermis layer, and regulates the regulation of helper T cells (Th)1 and Th2 cells. The initial dose of phototherapy administered to patients with chronic spontaneous urticaria was 200 mJ/cm^2, which was then increased by 10-20% at each follow- up visit.[11] Based on this description, the purpose of this case report is to add insight and provide information about the use of phototherapy as adjuvant therapy in chronic spontaneous urticaria patients.

CASE REPORT

A 35-year-old woman from Surakarta came for treatment at the Dermatology and Venereology Clinic of RSUD Dr. Moewardi Surakarta, with complaints of hives in several body parts. In the autoanamnesis history of the present condition, the patient reported frequent hives that appeared and disappeared over the last 6 months. The skin lesions first appeared on the forearm and then spread to the face, chest, abdomen, back and legs, accompanied by itching that interfered with the patient's sleep. There were no skin lesions in the eye or lip area, and she did not complain of a burning sensation. The patient consulted with general practitioner and received oral medication (no information on the name); the complaints disappeared and then reappeared. Three months ago, the patient complained of hives appearing more and more often, accompanied by itching. The patient's complaints did not improved, and she returned to UNS Hospital for treatment with a dermatology and venereology specialist. The patient received cetirizine 10 mg daily and moisturizer (containing sodium hyaluronate, *Vitis vinifera, Butyrospermum parkii* butter, telmesteine, and glycyrrhetinic acid), which was applied twice a day all over the body. The itching and hives subsided but reappeared a few days later.

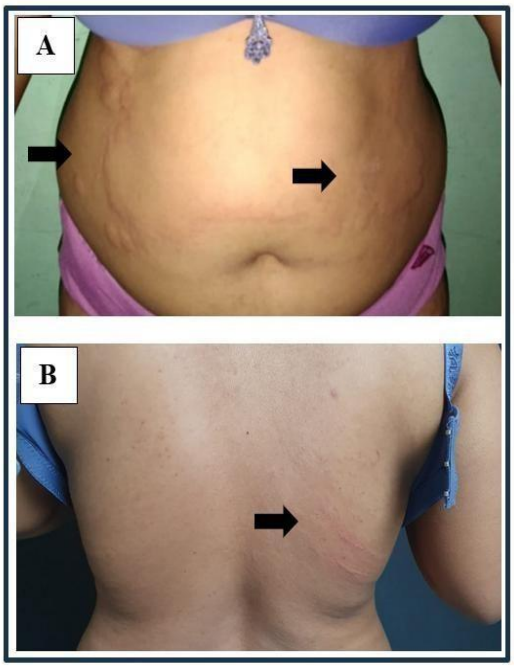

Figure 1. Photograph of the patient's first arrival (A & B). The anterior and posterior trunk regions: urticaria with multiple discrete erythematous bases of varying size.

The patient was the referred to the Dermatology and Venereology Polyclinic of RSUD Dr. Moewardi Surakarta to get further treatment. Past medical history revealed that the patient has never had a similar skin disease before, no history of allergies to food or medicine, no frequent sneeze in the morning, no hypertension, diabetes mellitus, or autoimmune diseases. There is no report of family members with similar complaints.The results of physical examination and vital signs were within normal limits, while the dermatological status of the anterior and posterior trunk regions showed several scattered wheals with varying sizes and reddish skin base (Figure 1). Based on the history and physical examination, the patient's differential diagnosis was chronic spontaneous urticaria and chronic autoimmune urticaria.

We carried out several supporting examinations to establish the diagnosis and rule out the differential diagnosis in this case. Figure 2A is a skin prick test, and Figure 2B is an autologous serum skin test. Skin prick test results were positive for house dust, mites, grass and rice powder, cockroaches, chocolate, tea, peanuts, egg yolks, egg whites, pineapples, tomatoes, cashews, dog hair, wheat, cow's milk, cobs, snapperfish, shrimp, milkfish, chicken, squid, crab and clams.

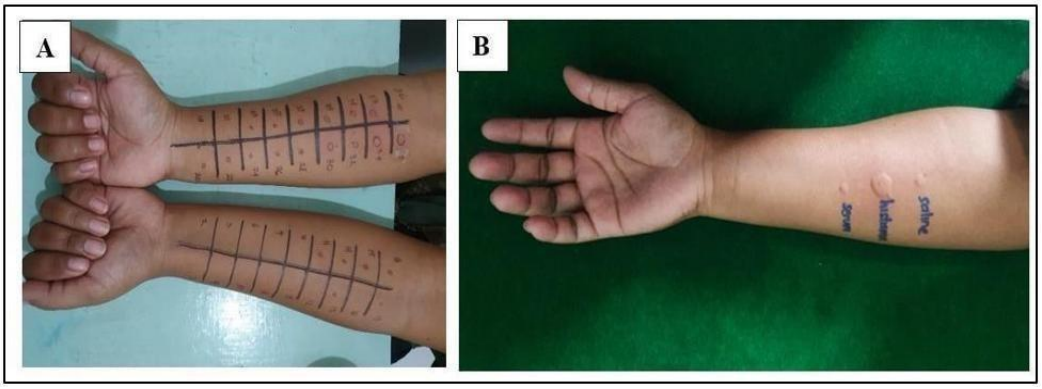

Figure 2. Results of skin prick test and autologous serum skin test. (A) A positive skin prick test showed greater erythema and wheals than the control (histamine) on some allergens. (B). The autologous serum skin test was negative; no erythema or wheals were greater than the control (histamine).

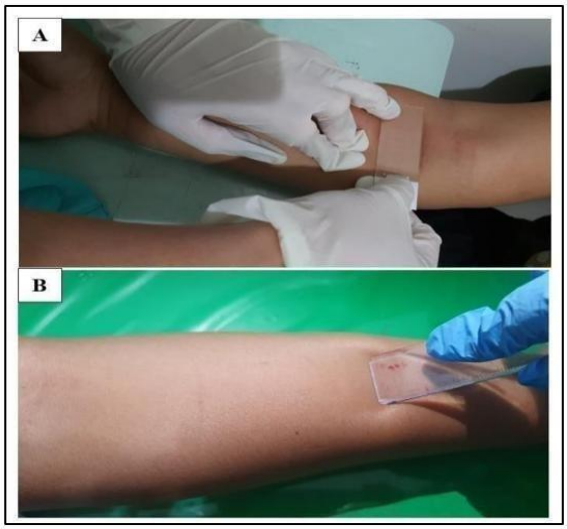

Figure 3. Results of diascopy and dermographic examination. (A) A positive diascopy examination with an erythematous appearance disappears when pressured with an object glass. (B) A negative dermography examination showed no erythema and urticaria on compression.

Figure 3A is a diascopy examination and Figure 3B is a dermographic examination. An additional examination was performed, namely the autologous serum skin test (ASST). In this patient the ASST results were negative. The patient received treatment based on the algorithm for treating chronic spontaneous urticaria. The treatment included first- and second- generation H1 antihistamines such as cetirizine 1 x 10 mg, chlorpheniramine maleate 1 x 4 mg, H2 antihistamines such as ranitidine 2 x 150 mg and corticosteroids such as methylprednisolone 1 x 4 mg, but was unsuccessful. Thus, the patient was given adjuvant therapy, consisting of NB-UVB phototherapy at 200 mJ/cm^2 per week. NB-UVB phototherapy inhibits pro-inflammatory mediators and cytokines that contributes to chronic spontaneous urticaria. After 4 weeks of therapy, significant clinical improvement was achieved.

DISCUSSION

The incidence of chronic urticaria in women is two times higher than in men. Chronic urticaria can

occur in both children and adults, although it is more common in adults, with the highest prevalence in the age range of 50-60 years.[12,13]

The characteristics manifestations of chronic spontaneous urticaria are well-defined reddish urticarial plaques and pale or erythematous edges with minimal edema.[14] Complaints ranging from intense itching to sensations such as burning accompanied the occurrence of urticaria. Urticarial plaques can develop within minutes and heal within 1-24 hours without leaving a scar.[15,16] In this case, it occurred in a 35-year- old woman with complaints of hives that itch and come and go spontaneously since the last 6 months. There were no complaints of swelling in the eyes or lips or difficulty swallowing or breathing. Dermatological status showed several well-defined reddish urticaria of varying sizes.

A skin prick test is an allergy test that involves pricking the test with inhaled allergens and food allergens to assess the allergic response. The Skin Prick Test is performed in stages, beginning with marking the skin based on the type of allergy to be examined, followed by dripping the allergen on the marked skin, pricking the skin using a needle to allow the allergen to enter the skin, and observing signs of allergy such as wheals after 15-20 minutes. The autologous serum skin test (ASST) is an in vivo test that assesses autoreactivity.[15,17] Autoreactivity is characterized by an itching and flare response to autologous intradermally injected factors that react indirectly through the release of mediators from mast cells or other cells and also directly through the skin microvasculature. Autoreactivity may be an indication that mast cells activate functional autoantibodies in autoimmune chronic urticaria patients. The appearance of erythematous patches and wheals after intradermal injection of autologous serum in a patient with autoimmune chronic urticaria is the first indicator of the presence of circulating autoantibodies in the patient. These observations suggest that ASST can be used as a basis for the diagnosis of autoimmune chronic urticaria.[18,19]

The patient's differential diagnosis was autoimmune chronic urticaria. Standard antihistamine therapy does not effectively treat autoimmune chronic urticaria, which is chronic urticaria associated with autoimmune disease.[19] Autoimmune diseases associated with autoimmune chronic urticaria include thyroid disease, vitiligo, diabetes mellitus, pernicious anemia and rheumatoid arthritis.[20,21] Several previous studies have described the presence of anti-thyroid peroxidase antibody and the fact that abnormal thyroid function is common in patients with chronic autoimmune urticaria.[22,23] In this case, the physical examination revealed no signs of thyroid disorders, vitiligo, diabetes mellitus, anemia, or arthritis symptoms, ruling out autoimmune chronic urticaria.

Treatment of chronic spontaneous urticaria begins with identifying the causative factor and eliminating the causative or triggering factor of urticaria. The most commonly used medical therapy is second-generation antihistamines and then first- generation antihistamines. Other therapies sometimes used for patients who are resistant to antihistamine therapy include corticosteroids, cyclosporine, and omalizumab.[24,25]

In this case, second generation H1 antihistamines and corticosteroids administered according to the algorithm was ineffective, necessitating adjuvant therapy. Another adjuvant therapy that can be used in patients with chronic spontaneous urticaria is phototherapy. Phototherapy is a therapeutic modality in dermatology based on the use of ultraviolet (UV) light and has influenced the treatment of different skin diseases dramatically.[26] Phototherapy has several mechanisms to achieve therapeutic effect, including anti-inflammatory and immunomodulatory effects on various elements of the immune system, inhibition of deoxyribonucleic acid (DNA) synthesis and keratinocyte proliferation, and reduction of *Staphylococcus aureus* colonization.[27] The Korean Academy of Asthma, Allergy, and Clinical Immunology (KAAACI) and the Korean Dermatological Association (KDA) Evidence-Based Practice Guideline suggest that narrowband UVB (NB-UVB) phototherapy can be added to H1- antihistamine treatment for the treatment of chronic spontaneous urticaria and symptomatic dermographism.[27]

Phototherapy has several types depending on the light modality used, namely UVB light, UVA light or UVA light with a photosensitizer combination (PUVA). Phototherapy is also divided into two categories on the extent of the lesion: conventional phototherapy with exposure covering the whole body (both skin with abnormalities and skin that looks normal) and targeted phototherapy such as excimer laser with a narrower exposure and adjusted to the location of the skin with abnormalities.[28]

This report indicates that the combination of antihistamines and NB-UVB has a significant effect on treating chronic spontaneous urticaria. Thus, NB-UVB is a promising alternative method for providing adjuvant treatment for patients with stubborn chronic

spontaneous urticarias which does not improve with administration of antihistamines aloe.

REFERENCES

1. Zuberbier T, Aberer W, Asero R, Abdul-Latiff AH, Baker D, Ballmer-Weber B. The EAACI/GA2LEN/EDF/WAO guideline for the definition, classification, diagnosis and management of urticaria. Allergy. 2018;73(7):1393-414.
2. Webster L, Rider N L, Archambault ME. Evaluating and managing chronic idiopathic urticaria in adults. J Am Acad Phys. 2018;31(7);22-6.
3. Lee SJ, Ha EK, Jee HM, Lee KS, Lee SW, Kim MA, et al. Prevalence and risk factors of urticaria with a focus on chronic urticaria in children. Allergy Asthma Immunol Res. 2017;9(3):212-9.
4. Lee N, Lee JD, Lee HY, Kang DR, Yel YM. Epidemiology of chronic urticaria in korea using the korean health insurance database 2010-2014. Allergy Asthma Immunol Res. 2017;9(5):438-45.
5. Wirantari N, Rosita C, Prakoeswa S. Urtikaria dan angioedema: studi retrospektif. Berkala Ilmu Kesehatan Kulit dan Kelamin. 2010;22(1): 213-9.
6. Vestergaard C, Deleuran M. Chronic spontaneous urticaria: Latest developments in aetiology, diagnosis and therapy. Ther Adv Chronic Dis. 2015;6(6):304-13.
7. Magerl M, Altrichter S, Borzova E, Giménez-Arnau A, Grattan CEH, Lawlor F, et al. The definition, diagnostic testing, and management of chronic inducible urticarias - The EAACI/GA2LEN/EDF/UNEV consensus recommendations 2016 update and revision. Allergy Eur J Allergy Clin Immunol. 2016;71(6):780-802.
8. Kanani A, Betschel SD, Warrington R. Urticaria and angioedema. Allergy Asthma Clin Immunol. 2018; 14(2): 59-60.
9. Stepaniuk P, Kan M, Kanani A. Natural history, prognostic factors and patient perceived response to treatment in chronic spontaneous urticaria. Allergy Asthma Clin Immunol. 2020;16(1):60-3.
10. Kaplan AP. Chronic Spontaneous Urticaria: Pathogenesis and Treatment Consideration Allergy Asthma Immunol Res.2017;9(6):477-82.
11. Sheikh G, Latif I, Sideeq K, Hassan I, Jabeen Y, Keen A. Role of adjuvant narrow band ultraviolet B phototherapy in the treatment of chronic urticaria. Indian J. Dermatol. 2019; 64(3): 1-5.
12. Fricke J, Avila G, Keller T, Weller K, Lau S, Maurer M, et al. Prevalence of chronic urticaria in children and adults across the globe: Systematic review with meta-analysis. Allergy. 2020;75(2): 423-32.
13. Rafikasari A, F Deasy, Setyaningrum T. Profil pasien urtikaria (profile of urticaria patients). Berkala Ilmu Kesehatan Kulit dan Kelamin.2019;31(3):222-7.
14. Fitria. Aspek Etiologi dan Klinis pada Urtikaria dan Angioedema. J Kedokt Syiah Kuala. 2013;13(2):96-104.
15. Grattan CEH, Sabroe RA, Greaves MW. Chronic urticaria. J Am Acad Dermatol. 2002; 46(5): 64557.
16. Mandel VD, Alicandro T, Pepe P, Bonzano L. Chronic spontaneous urticaria: A review of pathological mechanisms, diagnosis, clinical management and treatment. EMJ. 2020; 5(1):2939.
17. Vestergaard C, Deleuran M. Chronic spontaneous urticaria: Latest developments in aetiology, diagnosis and therapy. Ther Adv Chronic Dis. 2015; 6(6): 304-13.
18. Grattan CEH, Sabroe RA, Greaves MW. Chronic urticaria. J Am Acad Dermatol. 2002; 46(5): 64557.
19. 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.
20. Baig SA, Balachandran C, Nayak S. Comparative evaluation of autologous serum skin test and autologous plasma skin test in chronic urticaria. Journal of Pakistan Association of Dermatologists. 2013;23(4):378–83.
21. Amar SM, Dreskin SC. Urticaria. Prim Care Clin Office Pract. 2008; 35: 141-57
22. Godse KV. Autologous serum skin test in chronic idiopathic urticaria. Indian J Dermatol Venereol Leprol 2004; 70: 283-4.
23. Sanchez-Borges M, Asero R, Ansotegui IJ, Baiardini I, Bernstein JA, Canonica GW, et al. WAO Scientific and Clinical Issues Council: Diagnosis and treatment of urticaria and

angioedema: a worldwide perspective. World Allergy Oragnization Journal. 2012,5:125-47

24. Maurer M, Rosen K, Hsieh H-J, Saini S, Grattan C, Gimenez-Arnau A, Agarwal S, Doyle R, et al. Omalizumab for the treatment of chronic idiopathic or spontaneous urticaria. N Engl J Med. 2013;368:924-35.
25. Metz M, Ohanyan T, Church MK, Maurer M: Omalizumab is an effective and rapidly acting therapy in difficult-to-treat chronic urticaria: a retrospective clinical analysis. J Dermato Sci. 2013;73(9):57-62.
26. Sheikh G, Latif I, Lone KS, Hassan I, Jabeen Y, Keen A. Role of Adjuvant Narrow Band Ultraviolet B Phototherapy in the Treatment of Chronic Urticaria. Indian J Dermatol. 2019 May-Jun;64(3):250.
27. Chen J, Zeng X, Chen Q, Liang B, Pen L, Li H, et al. Efficacy of NB-UVB as on therapy to antihistamine in the treatment of chronic urticaria: a systematic review and meta-analysis. J. Derm and Therapy. 2021;11(1):681-94.
28. Yeon H, Hwa M, Lee H, Sung H, Juan S, Young K. Phototherapy May be a Useful Adjuvant Therapy for Retractable Chronic Spontaneous Urticaria: A Systematic Review. J Photochemestry and photobiology. 2019;10(3):1-3.