

Alternative Therapy for Autosensitization Dermatitis

Ya-Ting Chang, MD; Jiann-Jong Shen², MD, PhD; Wen-Rou Wong¹, MD;
Hung-Rong Yen, MD

During outdoor activities, *Dendrocnide meyeniana* can induce severe acute dermatitis, which usually needs topical or systemic corticosteroids, and oral antihistamine to alleviate associated symptoms such as exudation, pruritus or burning sensation. In this paper we report a 14-year-old male, with autosensitization dermatitis caused by *Dendrocnide meyeniana*, who had erythematous papules accompanied by itching and stinging sensations over left inner elbow first and then extended to the trunk and limbs. Based on the theory of traditional Chinese medicine (TCM) and pharmacological studies, the combined formula of *Xiao-feng-san* (XFS) and *Huang-lian-jie-du-tang* (HLJDT) was prescribed in the form of concentrated herbal extracts per oral. Remission of skin lesions and the accompanied symptoms was observed after treatment using the TCM formula for 7 days. Follow-up of the patient showed no relapse. We therefore conclude that TCM herbs may provide an alternative treatment for autosensitization dermatitis caused by *Dendrocnide meyeniana*. (*Chang Gung Med J* 2009;32:668-73)

Key words: autosensitization dermatitis, plant-induced dermatitis, traditional Chinese medicine, pruritus, *Dendrocnide meyeniana*

Autosensitization dermatitis involves a hyperirritable skin reaction in which an acute dermatitis develops at cutaneous sites distant from a primary inflammation focus, and where the secondary acute dermatitis is not explained by the cause of the initial inflammation. Factors such as infection, trauma, irritant chemicals, and ionizing radiation, are known to precipitate autosensitization.⁽¹⁾ Clinical and histopathological manifestations are variable and depend on the etiology of the autosensitization dermatitis. *Dendrocnide meyeniana* (Walp.) Chew (Fig. 1), poisonous wood nettle, also called Bazyuru by Piwan people of Taiwan, belongs to the Urticaceae family. It is a common plant growing in low mountain area above sea level in the middle or southern part of Taiwan, Lanyu, Green Island, and the

Philippines. With the silicon/calcium-contained stinging hairs (trichomes) and pearl glands on the leaf surfaces,⁽²⁾ *Dendrocnide meyeniana* may give rise to pruritus, pain, stinging sensation, and wheals after contact with skin.

Based on the theory and diagnostic principles of traditional Chinese medicine (TCM), the pathogenesis of acute dermatitis caused by *Dendrocnide meyeniana* is regarded as “noxious wind-damp-heat evil.” Therefore, formulas such as *Xiao-feng-san* (XFS) and *Huang-lian-jie-du-tang* (HLJDT), which are used to dispell wind, disinhibit dampness, and clear heat as well as resolve toxins, respectively, are proposed to treat acute dermatitis under the above stated circumstances.

From the Department of Gynecology and Pediatrics, Center for Traditional Chinese Medicine; ¹Department of Dermatology, Chang Gung Memorial Hospital at Taipei, Chang Gung University College of Medicine, Taoyuan, Taiwan; ²School of Chinese Medicine, College of Medicine, Chang Gung University, Taoyuan, Taiwan.

Received: Mar. 5, 2008; Accepted: Oct. 15, 2008

Correspondence to: Dr. Wen-Rou Wong, Department of Dermatology, Chang Gung Memorial Hospital, Chang Gung Memorial Hospital, 199, Dunhua N. Rd., Songshan District, Taipei City 105, Taiwan (R.O.C.) Tel.: 886-2-27135211 ext. 3397;

Fax: 886-2-27191623; E-mail: wongw@cgmh.org.tw



Fig. 1 *Dendrocnide meyeniana* (Walp.) Chew.

CASE REPORT

A 14 year-old male visited our outpatient clinic presenting with generalized itching erythematous eruptions for a period of one day. (Fig. 2) The parents of the patient disclosed that erythematous papules with intense itching and stinging sensation over the patient's left inner elbow fossa occurred one day after the patient had played outdoors. It became apparent that the patient's left arm had contact with *Dendrocnide meyeniana*. Alternative causes such as caterpillars or other insects were ruled out as none were observed during the patient's outdoor activities. Consequently pruritic eruptions followed over the upper limbs, and then extended to the trunk and to



Fig. 2 Skin eruptions on the trunk and limbs before TCM treatment.

the lower limbs. The pruritus and burning sensation was persistent and resulted in sleep disturbance. Physical examination revealed scattered generalized pruritic erythematous papules with localized heat over the trunk, neck and four limbs. The lesions appeared most prominently over the left inner arm. No vesicles, lichenification, scales, or dermatographism were observed. The patient had the history of allergic rhinitis but without asthma or atopic dermatitis. Examination for serum IgE level and skin biopsy was recommended, but the patient refused. The patient disclosed no further symptom related complaints. Fever, cough, or abdominal discomfort was not noted.

After autosensitization dermatitis associated with plant-induced contact dermatitis was confirmed by the dermatologist, a combined TCM formula of XFS and HLJDT (XFS/HLJDT ratio = 1:1) in the form of concentrated herbal extracts was prescribed with dosage of 4 g to be taken 3 times daily for 7 days (each 12 g dose contained Radix Angelicae Sinensis 0.5 g, Radix Rehmanniae 0.5 g, Radix Ledebouriellae 0.5 g, Periostracum Cicadae 0.5 g, Rhizoma Anemarrhenae 0.5 g, Radix Sophorae Flavescentis 0.5 g, Fructus Cannabis 0.5 g, Herba Schizonepetae 0.5 g, Rhizoma Atractylodis 0.5 g, Fructus Arctii 0.5 g, Gypsum Fibrosum 0.5 g, Radix Glycyrrhizae 0.25 g, Caulis Akebiae 0.25 g, Radix Scutellariae 1.5 g, Rhizoma Coptidis 1.5 g, Cortex Phellodendri 1.5 g, Gardeniae Fructus 1.5 g, in powder, per oral). The pruritus with the associated stinging sensation and localized heat decreased in severity in the first 3 days following the initial ingestion of the TCM formula, and totally disappeared after 7 days of treatment. Simultaneously during the course of treatment, the color of the erythematous papules changed to dark-brown. (Fig. 3) These post-inflammatory hyperpigmented papules gradually faded in the following 10 days. During TCM treatment period the patient reported no discomfort.

DISCUSSION

Dendrocnide meyeniana is a small evergreen arbor with simple leaf intergrowth, a 5-13 cm petiole length, a 15-40 cm blade of long oval form and shallow heart shape, a feather form nervure with stinging trichomes under the blade. One of the major components of *Dendrocnide meyeniana* which is proposed



Fig. 3 Day 7 of TCM use, the skin lesions improved.

to induce the acute dermatitis is the organic acid including the formic acid released from the pearl glands.^(3,4) Nevertheless, the clinical presentation of this case is not merely the formic acid-induced irritant contact dermatitis but an autosensitization reaction with extensive dermatitis over the trunk and the other limbs.

According to the theories and the diagnostic methodologies in Traditional Chinese Medicine, the eight principles (yin, yang, exterior, interior, cold, heat, deficiency, and excess), Qi and Blood, the Viscera and Bowels, and the six excesses (wind, cold, summer-heat, dampness, dryness, and fire as environmental phenomena) are the main guiding principles of pattern identification to classify the dermatologic disorders into several categories.⁽⁵⁾ Based on the pattern identification of cutaneous signs, in addition to a tongue inspection and pulse examination, clinical physicians prescribe different mixtures of herbs appropriate for the subtype of skin disorders. The color, luster, moisture, swelling, region of distribution, size and morphology of the skin lesions, the frequency of occurrence, and accompanying symptoms are crucial in the process of pattern identification in TCM dermatology.⁽⁵⁾ As for this patient, the rapid onset of skin lesions and consequent rapid distribution is related to wind evil because “wind is mobile and changeable.”⁽⁶⁾ The elevated skin lesions followed by unbearable itching without rough skin scaling were categorized as a dampness pattern because dampness tends to stagnate. The erythematous eruptions with localized heat over the trunk and four limbs are characteristic signs of a repletion heat

pattern. In short, the pathophysiologic mechanism of the acute dermatitis caused by *Dendrocnide meyeniana* in TCM is evident as the contraction of external evil with wind-damp-heat. This invades the skin however it is neither allowed a free coursing of the interior nor allowed an out let from the exterior thereby causing persistent itching. Therefore, the principles of TCM therapy for this patient is to disperse wind, dispel dampness, clear heat and toxin away, hence combined use of XFS and HLJDT.

Plant-related dermatitis has been treated with various herbal medicines without the use of topical or systemic corticosteroids.^(7,8) Treatments of TCM have been reported to have a level of effectiveness in treating dermatologic diseases, such as atopic dermatitis.^(9,10) In clinical practice, XFS is well-known for its antipruritic effect and widely used to treat chronic skin diseases such as urticaria and atopic dermatitis. Pharmacological studies revealed that XFS not only reduced delayed-type hypersensitivity responses by decreasing the level of interleukin-2 in a rat model⁽¹¹⁾ but also inhibited IgE-dependent histamine release from interleukin 3-dependent mast cells.⁽¹²⁾ Furthermore, HLJDT has been reported to have anti-inflammatory effects which suppresses interleukin-8 production, nitric oxide production in macrophage, and inflammation-induced mRNA expression of neuropeptides⁽¹³⁾ *in vitro*. In this patient, we hypothesize that the anti-histamine-like effect of XFS and anti-inflammatory effect of HLJDT play major roles in antipruritic response, and recommend that further pharmacological studies on mechanisms would be required.

As stated in this case, the patient's contact with *Dendrocnide meyeniana* is the main precipitating factor responsible for the autosensitization reaction. The pathogenesis of autosensitization dermatitis is thought to be related with increased HLA-DR- and IL-2R-positive T lymphocytes,⁽¹⁴⁾ with the elevated ratio of helper to suppressor T lymphocytes,⁽¹⁵⁾ and with hematogenous dissemination of epidermal cytokines from a primary focus.⁽¹⁶⁾ Baicalin and baicalein in *Radix Scutellariae*, a key ingredient herb in HLJDT, offers some anti-inflammatory effects by means of alleviating endothelial cell damage and decreasing recruitment of eosinophils via cytokines, but may not directly influence T lymphocytes.^(17,18)

In consideration of both an effective and safe TCM regimen, concentrated herbal extracts were

sourced from a pharmaceutical factory of good manufacturing practice and qualification instead of alternative natural product sources as a consideration for possible chemical or heavy metal contamination. It has been noted that side effects from HLJDT had been reported in a Japanese medical journal stating that few patients had chest tightness, loose stool passage, or diarrhea during the use of HLJDT, but the symptoms subsided after discontinuation of the regimen. Though HLJDT is common in the treatment of diarrhea especially caused by bacterial infection, one of the components, baicalein, may have caused secretory diarrhea in a recent pharmacologic study.⁽¹⁹⁾ However, the other ingredients in HLJDT have a pharmacokinetic interaction with baicalein, hence decline the systematic exposure level and decrease diarrhea.⁽²⁰⁾

To date, systemic or topical corticosteroids remain the principle therapy for plant-induced dermatitis because they decrease cytokine production and halt lymphocyte proliferation, while oral antihistamines provide antipruritic effects. In our case, the patient took concentrated herbal extracts for 7 days without any steroid therapy. No adverse effects occurred during 7 days of TCM therapy. The resolving of eruptions may be the result of natural course, however in this case the overt and sustained symptomatic relief suggest TCM herbs are potentially a valuable therapy. This case report is the first noted successful treatment of autosensitization dermatitis by herbal medicine. Molecular mechanisms however need further investigation. Substantial data including larger patient numbers and rigorous clinical trials are needed to provide evidence for the combined formula of XFS and HLJDT as an effective treatment for acute dermatitis caused by *Dendrocnide meyeniana* or other species.

Acknowledgements

Thanks are due to Prof. Nigel Wiseman, School of Chinese Medicine, Chang Gung University College of Medicine, Taoyuan, Taiwan, for editing the English expression of the text.

REFERENCES

1. Wolff K, Goldsmith LA, Katz SI, Gilchrist BA, Palle AS, Leffell DJ. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill, 2008:167-8.
2. Fu HY, Chen SJ, Kuo-Huang LL. Comparative study on the stinging trichomes and some related epidermal structures in the leaves of *Dendrocnide meyeniana*, *Girardinia diversifolia*, and *Urtica thunbergiana*. Taiwania 2003;48:213-23.
3. Taskila K, Saarinen JV, Harvima IT, Harvima RJ. Histamine and LTC4 in stinging nettle-induced urticaria. Allergy 2000;55:680-1.
4. Fu HY, Chen SJ, Chen RF, Ding WH, Kuo-Huang LL, Huang RN. Identification of oxalic acid and tartaric acid as major persistent pain-inducing toxins in the stinging hairs of the Nettle, *Urtica thunbergiana*. Ann Bot (Lond) 2006;98:57-65.
5. Ping C. Diagnosis in Traditional Chinese Medicine. 1st ed. New Mexico: Complementary Medicine Press, 2004:19-35.
6. Nigel W, Fong Y. Introduction to English terminology of Chinese medicine. 2nd ed. Taiwan: Ho-Chi Co., 2003:21.
7. Springhouse corporation. Nursing herbal medicine handbook. 3rd ed. Philadelphia: Lippincott Williams & Wilkins, 2006:457.
8. Canavan D, Yarnell E. Successful treatment of poison oak dermatitis treated with *Grindelia* spp. (Gumweed). J Altern Complement Med 2005;11:709-10.
9. Hon KL, Leung TF, Wong Y, Lam WK, Guan DQ, Ma KC, Sung YT, Fok TF, Leung PC. A pentaherbs capsule as a treatment option for atopic dermatitis in children: an open-labeled case series. Am J Chi Med 2004;32:941-50.
10. Zhang W, Leonard T, Bath-Hextall F, Chambers CA, Lee C, Humphreys R, Williams HC. Chinese herbal medicine for atopic eczema. Cochrane Database Syst Rev 2004;4:CD002291.
11. Zheng YQ, Dai M, Chen GL, Wei W. Study of the anti-allergy and mechanism of Xiao Fengsan Granules. J Exp Trad Med Formulae 2002;8:26-8.
12. Kosaburo S, Hirohisa S. Effect of Chinese herbal medicines and disodium cromoglycate on IgE-dependent histamine release from mouse cultured mast cells. Int J Immunopharmacol 1997;19:677-82.
13. Yi D, Kenji M, Tetsuo F, Atsushi T, Toshiya T, Eiji K, Koichi N. Suppression of neuropeptides' mRNA expression by herbal medicines in a rat model of peripheral inflammation. Life Sci 2000;66:19-29.
14. Kasteler JS, Petersen MJ, Vance JE, Zone JJ. Circulating activated T lymphocytes in autoeczematization. Arch Dermatol 1992;128:795-8.
15. Cunningham MJ, Zone JJ, Petersen MJ, Green JA. Circulating activated (DR-positive) T lymphocytes in a patient with autoeczematization. J Am Acad Dermatol 1986;14:1039-41.
16. Williams IR, Kupper TS. Immunity at the surface: Homeostatic mechanisms of the skin immune system. Life Sci 1996;58:1485-92.
17. Kim DH, Cho KH, Moon SK, Kim YS, Kim DH, Choi JS, Chung HY. Cytoprotective mechanism of baicalin against endothelial cell damage by peroxynitrite. J Pharm

- Pharmacol 2005;57:1581-90.
18. Nakajima T, Imanishi M, Yamamoto K, Cyong JC, Hirai K. Inhibitory effect of baicalein, a flavonoid in Scutellaria root, on eotaxin production by human dermal fibroblasts. *Planta Medica* 2001;67:132-5.
 19. Yue GG, Yip TW, Huang Y, Ko WH. Cellular mechanism for potentiation of Ca²⁺-mediated Cl⁻ secretion by the flavonoid baicalein in intestinal epithelia. *J Biol Chem* 2004;279:39310-6.
 20. Lu T, Song J, Huang F, Deng Y, Xie L, Wang G, Liu X. Comparative pharmacokinetics of baicalin after oral administration of pure baicalin, Radix scutellariae extract and Huang-Lian-Jie-Du-Tang to rats. *J Ethnopharmacol* 2007;110:412-8.

中藥治療自體敏感性皮膚炎經驗

張雅婷 沈建忠² 翁雯柔¹ 顏宏融

這位 14 歲的患者在野外交觸到咬人狗而出現全身性紅腫發癢的皮疹，使用口服濃縮中藥（消風散合黃連解毒湯）一週後，皮膚刺癢灼熱症狀緩解，而紅疹也在 10 天後消失。我們經由這個病例發現中藥可提供自體敏感性皮膚炎患者另一種止癢、消炎的治療方法。（長庚醫誌 2009;32:668-73）

關鍵詞：自體敏感性皮膚炎，植物性皮膚炎，中醫，皮膚癢，咬人狗