

Report

Contact dermatitis: a common adverse reaction to topical traditional Chinese medicine

Priya Sen¹, MRCP, Madeline SL Ho¹, MRCP, See-Ket Ng¹, M Med, and Gil Yosipovitch², MD

¹National Skin Centre, Singapore, and

²Department of Dermatology, Neurobiology & Anatomy, and Regenerative Medicine, Wake Forest University Health Sciences, Winston-Salem, NC, USA

Correspondence

Madeline S.L. Ho, MRCP
National Skin Centre
1 Mandalay Road
308205 Singapore
E-mail: sheunling@yahoo.com

Financial disclosure: None reported. No sponsors were required for the study.

Abstract

Background Over the past decade, there has been an increase in the use of topical traditional Chinese medicine (TTCM). The most common adverse event seen in the use of TTCM is contact dermatitis. This retrospective study was designed to determine the types of commonly used TTCM in Singapore causing contact dermatitis.

Methods We retrospectively reviewed the case notes of 10 patients seen at the National Skin Centre over a 4-month period with a diagnosis of adverse cutaneous reactions to TTCMs.

Results A total of 10 patients were diagnosed with contact dermatitis to TTCM at our institution over a 4-month period. The clinical manifestation ranged from eczematous lesions to urticarial plaques and blisters. Five of these patients were patch-tested to our standard series, our in-house TTCM series, as well as to the TTCM they had used. The other five patients declined patch testing. The results of patch testing confirmed the diagnosis of allergic contact dermatitis in three of the tested patients. Negative patch testing results inferred the diagnosis of irritant contact dermatitis to TTCM in the other two patients. Two of the patients with positive patch tests also had a positive reaction to balsam of peru and fragrance mix. The three positive patch tests were all caused by medicated oils.

Conclusions These results suggest it is likely that essential oils present as constituents of the medicated oils could be the possible allergen. The study also confirms that contact dermatitis is a common adverse event associated with the use of TTCM.

Introduction

Topical traditional Chinese medicine (TTCM) has been in use in the East for thousands of years. Over the past decade, there has been an increase in the use of TTCM by patients in the West in the search for alternative modes of therapy for dermatological and nondermatological disorders. A common misconception is that TTCM has no adverse effects as a result of its “natural” composition and that these “natural” substances are not harmful to the body. However, the most common adverse event seen with the use of TTCM is contact dermatitis. This retrospective study was designed to determine the types of commonly used TTCM in Singapore causing contact dermatitis. These would then be classified according to whether they caused irritant or allergic contact dermatitis.

Methods

The case notes of 10 patients seen at the National Skin Centre over a 4-month period with a diagnosis of adverse

cutaneous reactions to TTCMs were reviewed. Their clinical presentations were recorded and the type of TTCM used classified based on their usage (Table 1). This was divided into medicated oils used to soothe headaches, abdominal pains, itchy skin lesions; rheumatism oils used for rheumatism pains; bonesetter's herbs used for orthopedic injuries and bruised or contused muscle. A thorough analysis of the contents of these TTCMs was performed to delineate their contents for patch testing.

Photographs were taken of the cutaneous lesions at presentation and patch testing was performed on the patients when the primary dermatitis was quiescent and under control. This was performed to the TCM series as well as the patients original TTCM at subsequent follow-up. Patch tests were performed according to the International Contact Dermatitis Research Group recommendation using Finn chambers (Epitest Oy, Helsinki, Finland) on Scanpor tape (Norgesplaster A/S, Oslo, Norway). The substances used for patch testing included the standard series, other suspected substances relevant to the patient's dermatitis, and our in-house series of topical traditional Chinese medicaments (Table 2). The

Table 1 Classification of topical traditional Chinese medicine (TTCM) (based on usage)¹⁰

Type of TTCM	Contents	Uses	Common adverse cutaneous reactions
1. Medicated oils (wind-oils) e.g. Tiger Balm	Menthol Camphor 1 or more essential oils: cinnamon oil, oil of olive, cassia oil, citronella oil, oil of lavender, cajaput oil, (compounded together in a base oil or petrolatum)	To soothe headaches, abdominal pains, insect bite reactions and itchy skin lesions	Allergic contact dermatitis Positive patch test to fragrance mix, balsam of Peru
2. Rheumatism oils	Camphor Menthol Essential oils High concentration of methyl salicylates or oil of wintergreen	Rheumatism pains	Irritant contact dermatitis especially on damaged skin
3. Oils used for orthopedic injuries including bone-setter's herbs e.g. Tjin-Koo-Lin (balm for tendons and bones)	Camphor Menthol Essential oils Methyl salicylates Extracts of herbs Allergens: mastic + myrrh	Orthopedic injuries – bruised and contused muscle Note: bone-setter's herbs are pounded mixed with wine or honey and wrapped around injured bones or joints after manipulation	Allergic contact dermatitis – severe and purpuric
4. Miscellaneous TTCM	(i) Salicylic acid	(i) Ringworm	Contact dermatitis if used on eczematous skin

Table 2 Our in-house series of topical traditional Chinese medicaments

Allergen	Concentration	Vehicle
Axe oil	As is	
Eagle brand medicated oil	50%	Olive oil
Green grass oil	20%	Olive oil
Saw Hong Choon ung	As is	
Tiger Balm	10%	WSP
Tiger oil	As is	
Tjin Koo Lin	20%	Olive oil
White flower oil	As is	
Wong Cheung Wah oil	5%	Olive oil
Zhen Gu Shui (Yulin)	As is	

reactions were observed after 48 and 96 h and graded in the standard way.

Results

A total of 10 patients were diagnosed with contact dermatitis to TTCM within a 4-month period (Tables 3, 4). Their ages ranged from 14 years to 76 years of age. All the patients were Chinese except one patient who was Indian. The spectrum of clinical manifestations ranged from eczematous plaques, blisters and urticarial plaques confined to the site of TTCM application to more

extensive rashes with secondary spread on other areas of the body. Eczematous plaques on the dorsum of the right foot of patient 1 which developed 1 week after applying TTCM are shown in Fig. 1. In Fig. 2, an infected eczematous plaque with pustules which developed after applying TTCM medicated oil for eczema of left big toe is illustrated. The class of TTCM that produced the most severe reactions was the oils and ointments for orthopedic injury or “bonesetter’s herbs” which contain camphor, menthol, essential oils, methyl salicylates, extracts of herbs and allergens such as mastic and myrrh.

Of these, five patients were patch tested. The results of patch testing confirmed the diagnosis of allergic contact dermatitis to TTCM in three of these patients. Negative patch testing results inferred the diagnosis of irritant contact dermatitis to TTCM in the other two patients (Table 5). The remaining five patients declined patch testing. Skin biopsies were performed on patient 7 and 10, both of which showed spongiotic dermatitis with eosinophils.

Discussion

The use of TTCM is commonly practiced by the Chinese community in Singapore as well as by some of the other races. It contains Chinese herbal plant extracts as

Table 3 The type of topical traditional Chinese medicine (TTCM) used

Patient	Type of TTCM used	Purpose
1	Medicated oil (die da jing oil)	Toe sprain
2	Rheumatism oil + plaster	Knee injury
3	Medicated oil (Poh Sin oil)	Itch from eczema
4	Medicated oil (Axe oil, Green Grass oil)	Traumatic blister
5	Medicated oil (Yun-nan oil)	Toe eczema
6	Bone-setter's herbs	Ankle sprain
7	Medicated oil (Green Grass oil)	Itch
8	Medicated oil (Panosalap)	Skin infection
9	Medicated oil (Double Prawn Head oil)	Eczema
10	Medicated oil (Herbal balm)	Insect bites

**Figure 1** Patient 1: Eczematous plaques over the dorsum of the foot 1 week after application of topical traditional Chinese medicine for right toe sprain**Figure 2** Patient 5: Infected eczematous plaque with pustules developed after applying topical traditional Chinese medicine medicated oil

the main ingredients, notably terpenes (e.g. camphor and menthol) and essential-oil extracts (e.g. eucalyptus and cinnamon).¹ It can be purchased over the counter

at numerous Chinese medical shops and does not require a doctor's prior consultation or prescription. As a result, it is generally believed by a large number of patients to be harmless because of its natural composition and as it has no side-effects which are thought to be associated more with the use of "Western medicine". TTCM is widely used by patients in Singapore to soothe the symptoms of dermatologic conditions such as eczema, pruritus and insect bite reactions. Therefore, dermatologists may encounter some cases in which the topicals had either worsened or masked the underlying skin disease.

Contact dermatitis, both allergic and irritant, has been reported as a common adverse effect of TTCM.^{2,3} Ernst reviewed the adverse effects of herbal drugs in dermatology.⁴ The important points from this review were that almost all herbal remedies can cause allergic reactions and some can cause photosensitization. It is not surprising that these reactions develop as TTCM frequently contain herbs such as *Radix angelicae dahuricae*. This herb contains furocoumarins such as imperatorin, isoimperatorin and alloimperatorin, which combine with DNA in a similar fashion to psoralen plus ultraviolet A.⁵

Furthermore, it has been shown that Chinese herbal creams can be adulterated with steroid creams and Ayurvedic medicines can contain arsenic or mercury. Perhaps the most prevalent adulterant in herbal creams is corticosteroids.⁴ Other popular remedies that can potentially cause cutaneous side effects include St John's Wort, kava, aloe vera, eucalyptus, camphor, henna, and yohimbine. The reports on dermatologic adverse effects of topical and oral herbal treatments are numerous, and range from allergic contact dermatitis reactions to pruritic eruptions, urticaria, angioedema, and Stevens-Johnson syndrome.⁴⁻¹⁰ The most common dermatologic adverse reaction from TTCMs is allergic contact dermatitis.⁵ Three cases of allergic contact dermatitis caused by a Chinese orthopedic solution Tie Ta Yao Gin were reported in Hong Kong in which patch testing

Table 4 Clinical features

Patient	Age	Gender	Clinical features
1 (Fig. 1)	62	Male	Eczematous plaques on the dorsum of the right foot, which developed 1 week after applying TTCM for right toe sprain for 3 days
2	22	Female	Ten days later developed eczematous reaction on the forearms
3	61	Male	Urticarial plaque over the left knee developed 2 days after applying green paste and massage oil under plaster occlusion daily for 4 days
4	37	Male	Developed blisters and erythema 2 days after application of TTCM medicated oils for underlying hand and feet eczema
5 (Fig. 2)	50	Female	Erythematous plaque with blisters over the sides of the right foot with erythematous papules and plaque over the left ankle 2 days after applying TTCM medicated oil and plaster for traumatic blister on the heel
6	26	Female	Infected eczematous plaque with pustules developed after applying TTCM medicated oil for eczema of left big toe
7	26	Female	Developed acute eczematous rash over the left ankle 1 week after applying TTCM bone-setters herbs
8	76	Female	Developed extensive eczematous rashes on the whole body after applying TTCM medicated oil for months to relieve itch
9	42	Male	Developed eczematous rash on the ankles and thighs after two episodes of applying TTCM medicated lotion for an infection of the right ankle
10	53	Female	Developed generalized eczematous rashes 2 days after applying TTCM medicated oil
10	14	Female	Developed tumid large discoid plaques with central vesicles 2 days after applying TTCM herbal balm to insect bites

Table 5 Positive patch testing results

Patient	TTCM used	TTCM series	Standard battery
2	+ to massage oil	Negative	+ to nickel
4	+ to Green Grass oil	+ to Axe oil and Green Grass oil	+ to balsam of peru, fragrance mix, colophony
10 (Fig. 3)	+ to herbal balm	+ to Tigerbalm/oil, Green Grass oil, White Flower oil, Zhen Gu Shui oil, Wong Cheung Wah oil, Eagle brand medicated oil	+ to balsam of peru, fragrance mix, colophony, PPD (Paraphenylenediamine)

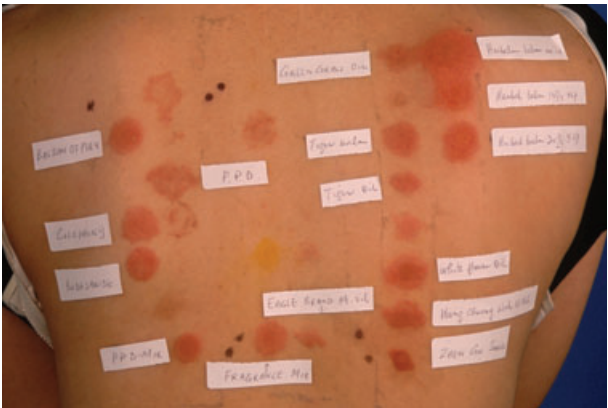


Figure 3 Positive patch test reactions in patient 10 to balsam of peru, colophony, PPD mix, green grass oil, tiger balm, fragrance mix, White Flower oil, Zhen Gu Shui oil, Wong Cheung Wah oil, Eagle brand medicated oil, PPD, herbal balm

demonstrated allergy to mastic and myrrh, natural gum resins widely used in traditional Chinese medicine to relieve pain and swelling caused by traumatic injury.⁷ The authors highlighted the importance of considering contact dermatitis caused by herbal medicine in Chinese patients presenting with eczematous lesions after traumatic injury. It is important to note that some reactions do not look like classical contact dermatitis and in some cases could include anaphylaxis, exudative erythema, necrotic skin lesions, and papulous skin eruptions.⁴

Our center has studied the role of topical traditional Chinese medicaments as contact sensitizers in chronic venous leg ulcer patients.⁸ Seven of 17 patients with TTCM use had at least 1 positive patch test reading to TTCM, giving a sensitization rate of 41%. The authors concluded that TTCM may be a significant factor in non or poor healing leg ulcers.



Figure 4 Severe bullous erysipelas-like reaction secondary to topical traditional Chinese medicine application in a patient (not in this study) from our center



Figure 5 Severe bullous eruption secondary to topical traditional Chinese medicine application in a patient (not in the study) at our center

Although this case series focussed on topical traditional Chinese medicaments, we would like to emphasize the fact that more serious cutaneous adverse effects such as angioedema, Steven-Johnsons syndrome, Bowen's disease, arsenical keratosis and squamous cell carcinoma can occur from the consumption of traditional Chinese medicines.⁴⁻⁹ In a previous case series from Singapore, serious cutaneous adverse reactions of toxic epidermal necrolysis from traditional Chinese medicine, acute generalized exanthematous pustulosis from piroxicam and salicylate-contaminated traditional Chinese medicine and two

patients with drug hypersensitivity syndrome-one from traditional Chinese medicine and the other from phenylbutazone-adulterated traditional Chinese medicine were reported.⁹

In this case series, the results of patch testing proved three patients had allergic contact dermatitis and two patients had irritant contact dermatitis to TTCM. The three positive patch tests were all caused by medicated oils. Two of these patients also had a positive reaction to balsam of peru and fragrance mix. Prior reports have emphasized the high rates of cross-sensitivity between the individual TTCM, as well as between TTCM and fragrance mix, balsam of peru or colophony.^{2,9} We conclude that the allergens in these two medicated oils were probably essential oils present as constituents of the medicated oil. We are unaware of any information in the literature of massage oils containing nickel thus the positive nickel patch test in patient 2 may not be relevant. One patient had a positive reaction to his own medicated oil but a negative reaction to our TTCM series. In this case, the allergen remains unknown. Of the two negative patch tests, one patient had an irritant reaction to his TTCM and the suspected compound was identified as anthralin. Figures 4 and 5 illustrate severe bullous reactions secondary to topical traditional Chinese medicine that occurred in other patients not in the study.

Conclusion

Adverse effects of TTCM are an important, albeit relatively neglected, subject in dermatology which deserves further investigation. This study serves as a pilot study to evaluate the types of TTCM causing either irritant or allergic contact dermatitis. It also highlights the importance of awareness of the adverse effects of herbal medicines in dermatology. Further studies are needed to evaluate the potential allergenic constituents of these commonly used TTCMs.

References

- 1 Leow YH, Ng SK, Wong WK, *et al.* Contact allergy potential of topical traditional Chinese medicaments in Singapore. *Am J Contact Dermatitis* 1995; 6: 4-8.
- 2 Leow YH. Contact dermatitis due to topical traditional Chinese medication. *Clin Dermatol* 1997; 15: 601-605.
- 3 Lee TY, Lam TH. Allergic contact dermatitis due to hair regrowth liniment. *Contact Dermatitis* 1989; 20: 389-390.
- 4 Ernst E. Adverse effects of herbal drugs in dermatology. *Br J Dermatol* 2000; 143: 923-939.
- 5 Koo J, Desai R. Traditional Chinese medicine in dermatology. *Dermatol Ther* 2003; 16: 98-105.

- 6 Oiso N, Yamadori Y, Higashimori N, *et al.* Allergic contact dermatitis caused by sesame oil in a topical Chinese medicine, shi-un-ko. *Contact Dermatitis* 2008; **58**: 109.
- 7 Lee TY, Lam TH. Allergic contact dermatitis to a Chinese orthopaedic solution Tieh Ta Yao Gin. *Contact Dermatitis* 1993; **28**: 89–90.
- 8 Lim KS, Tang MBY, Goon ATJ, *et al.* The role of topical traditional Chinese medicaments as contact sensitisers in chronic venous leg ulcer patients. *Ann Acad Med Singapore* 2007; **36**: 942–946.
- 9 Lim YL, Thirumoorthy T. Serious cutaneous adverse reactions to traditional Chinese medicines. *SMJ* 2005; **46**: 714–717.
- 10 Ng SK. Topical traditional Chinese medicine: a report from Singapore. *Arch Dermatol* 1998; **134**: 1395–1396.