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TARGETING ECZEMA TREATMENT BY CLEARING THE LIVER HEAT AND DETOXIFICATION: A CLINICAL CASE REPORT

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ABSTRACT

Eczema is a common non-communicable skin disease that has been around us for a long time. While the current protocols for treating eczema only focus on the part of the skin, the mostly used corticosteroids and palliative medications are often resulting in numerous side effects. Traditional Chinese Medicine (TCM) can therefore provide an alternative treatment for the disease, using the novel approach of the Liver-Skin axis relationship. Here we provide a case of an 11-year old girl who was treated using TCM with clearing liver and detoxing. With the use of a renowned TCM prescription, Long Dan Xie Gan Tang, chronic eczema was successfully controlled and even completely cured. In the present study, our clinical evidence was also complementary to the preceding clinic of Chinese Society; we suggest a novel therapy for eczema on reducing heat and detoxing of the liver by 'liver-skin axis' for the first time, which may play positive roles in treating eczema patients.

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Introduction

Eczema, also known as dermatitis, is a widespread skin disease around the world, and it can be categorized into distinct classes, namely atopic, contact, dyshidrotic, stasis**,** nummular, and seborrheic eczema. In China, the incidence rate of atopic eczema with the clinical diagnosis was in the overall of 12.94 percent, with varying proportions of mild (74.6 percent), moderate (23.96 percent), and severe (1.44 percent), respectively [1-3]. Atopic eczema is an inflammatory, chronic skin disease characterized by terrible itchy and eczematous lacerations. It is worsening in nature, often with recurrent burns, and can perhaps negatively affect the quality of life in affected individuals. A recent epidemiological and meta-analysis study suggests that atopic eczema is genetic-based along with primary causes of external environments, including, smoking [4]. The prevalence of eczema occurs in all age groups; however, it significantly appears during childhood [5]. The prevention strategies are greatly challenging and mostly used market-oriented corticosteroids and palliative medications are often resulting in various clinical complications after chronic usage [6]. Traditional Chinese Medicine (TCM) has a long history of treating skin disease systematically and efficiently. In TCM, eczema can be categorized into Wind, Dampness, and Heat syndromes. The use of TCM has widespread therapeutic effects for pediatric eczema skin rashes, and osteoporosis without any harmful consequence, which considers by many parents or caregivers and thus popular in the TCM dermatology clinics [7]. Hence, this case report aimed to provide therapeutic methods for dermatitis by using TCM and exploring the novel approach of the Liver-Skin axis relationship.

Case Study

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An 11-year-old girl was admitted into the Clinical Teaching Centre, Li Ka Shing Faculty of Medicine, the University of Hong Kong, Sassoon Road on August 03, 2020 (case number: SC46823). She had a complaint about the rashes and itchiness over the face and upper limbs for 4-5 years. After investigation, we found that eating tropical fruits, including, mango, and Lizhi caused severe skin rashes. During the summer of 2015, the rashes started to appear over her face and limbs, and they worsened after few days. Western or Chinese doctors primarily provided the treatment intervention as diagnosed as Eczema. The condition was fluctuating for the past 5 years with treatment interventions of Western and TCM medicine, including internal therapy using antihistamines and glucocorticoids to alleviate severe skin rashes and itchiness. Numerous topical treatments including hydrocortisone and emollient had also been employed, however, they had little effect.

Based on TCM's theory, we practiced four-step diagnosis for patients, viz., Inspection, Listening, Inquiry, and Pulse-taking. For inspection, the patient was observed to be in a calm down situation with a stable mental state. Based on the general inspection, local rashes and erythema were largely found on the head, neck, hands, and posterior parts of both arms. Particularly, a remarkable observation was rendered that the erythema was noticed on the palmar side of both hands (also identified as liver palm). The further probe showed that the patient had used the treatments of both modern and TCM medicines, but they had minor effects. She was highly nervous due to the high expectations and excitement. She had a normal appetite and frequency of excretion. It was noted that the tongue was thick, yellowish-coated with red color appeared on the lateral and medial side of the tongue. Her pulse was thin and string-like. Since Palmar Erythema was found, she was suggested to carry out a Liver Function Test (LFT).

Table 1. Prescriptions (Variations of *long dan xie gan tang* (龍膽瀉肝湯加減) for the 1st consultation on August 03, 2020

	Latin name	*Chinese name*	Dosage (g)
1.	Cicadae Periostracum	*Chantui*	6
2.	Sophorae Flavescentis Radix	*kushen*	15
3.	Glycyrrhizae Radix et Rhizoma	*gancao*	5
4.	Bombyx Batryticatus	*Jiangcan*	6
5.	Dictamni Cortex	*baixianpi*	15
6.	Lithospermum erythrorhizon Sieb. et Zucc.	*zicao*	12
7.	Moutan Cortex	*mudanpi*	15
8.	Atractylodis Rhizoma	*cangzhu*	10
9.	Rehmanniae Radix(raw)	*shengdihuang*	30
10.	Forsythiae Fructus	*lianqiao*	18
11.	Gentianae Radix et Rhizoma	*longdancao*	3
12.	Taraxacum mongolicum and. Mazz.	*pugongying*	15
13.	Lonicerae Japonicae Caulis	*rendongteng*	40
14.	Cynanchum paniculatum (Bge.) Kitag. ex Hara Dosage: oral intake for 7 days, twice a day, 1 bag of decoction per dosage,	*xuchangqing*	12

The prescription of *Long dan cao* is used to clear liver damp-heat and hotness **(Table 1)**; while *Kushen* and *baixianpi* are employed to clear damp heat in different organs. *Cangzhu* is added to tonify spleen Qi and treat the origin of dampness in the body. *Mudanpi, zicao, shengdihuang* can enter the blood to clear damp-heat. *Lianqiao, rendongteng, pugongying* can clear heat and toxins. *Xuchangqing* is used to invigorate blood and remove toxins **(Table 1)**.

We suggested the patient continue the internal therapy and, thus, she was prescribed to use the boiled herbs as a topical appliance, which was employed on the affected areas.

ALP were all within normal range. During the visit, we further prescribed along with regular: 10 gram of *rendongteng* to remove heat and toxins from the liver Qi. We removed the *shengdihuang* since it caused a very thick white-yellow tongue coat as of the original prescription **(Table 1)**.

For the third consultation of patient follow-up on August 24, 2020, we noticed the girl with complete disappearance of rashes and itchiness on the limbs and face and however, still small patches of dermatitis appeared on the face. Plamer erythema significantly subsided with her normal menstrual cycle. During the visit, we further prescribed along with regular: *cangzhu* was increased from 2g to 10g to better tonify spleen Qi; *rendongteng* was started to apply back around 40g; *wuweizi* (10g) was added as an astringent; *tufuling* (20g) was included to remove excess dampness; *jixueteng* (35g) was added to invigorate and tonify blood. We removed the *chantui*, Wind syndrome here was unremarkabl*e,* as of the original formula **(Table 1)**.

Follow-up Consultation

On January 05, 2021, we had a follow-up consultation with the patient and observed the situation. We noticed the patient, who was greatly improved with small areas of rashes only on the peripheral limbs. The palmar erythema had entirely subsided **(Figure 1)**. Inquiries on the menstruation cycle did not show any abnormalities such as amenorrhea and dysmenorrhea.

Figure 1. Comparison of the affected area during pre- and post-treatment

As shown in **Figure 1**, the appearance of eczema in the patient had significantly improved. The area of dermatitis had been greatly reduced to half as shown in the figure. Palmar erythema had also been reduced, implying the better functioning of liver detoxification.

Results and Discussion

Eczema is a notorious chronic disease, which is difficult to treat in Western Medicine, despite dedicated work that has been done by many researchers both on the mechanisms and the treatment of eczema in the clinical settings [8-11]. TCM can treat

eczema in many ways, such as removing wind, expelling dampness, string spleen, and so on. Several researchers have substantially explored the possible role of TCM in the management of eczema [12-14]. TCM involves the regulation of different organs and topical treatment on the skin.

The liver is an essential organ in our body and is involved in various metabolic effects along with detoxification [15, 16]. If the function of the detoxification process is not complete, hepatotoxicity might develop, which is reflected on the skin [17]. Earlier, it has been proved that in patients with liver diseases it may lead to an increase in melanin synthesis in the skin, triggering a dark complexion, brown streaks on nail plates, and liver palms [17, 18]. Therefore, the 'liver-skin axis' has a vital role and intricate key relationship to protect our body. However, the application of the liver-skin axis and method of treatment for patients with eczema has been uncertain to many practitioners [19]. There is a shred of limited evidence showing the presence of such an axis.

The underlying mechanism of eczema is due to the inflammatory mediators, which are triggered by lymphocytes and keratinocytes into the skin of patients with psoriasis. Liver dysfunction or hepatotoxicity-mediated pro-inflammatory mediators can influence the severity of psoriasis by increasing inflammation [20]. The aforementioned findings suggest that the liver and skin are interconnected and aid to produce inflammatory mediators. Moreover, Primary Biliary Cirrhosis has shown its close relationship with the skin [21]. Similarly, there is an inextricable link between PBC and cutaneous xanthomas, due to hypercholesterolemia [22]. Studies have shown that the mechanism of hypercholesterolemia is due to the production of cytokines such as interleukin-1, interleukin-6, and TNFα [23], in which they can overspill into the skin resulting in the formation of inflammation. Unfortunately, the above content is only hypothetical, and lacking very solid clinical trials and analysis.

In the present case study, despite the palmar erythema found on the patient's hands, all her LFT results were unremarkable, suggesting that skin manifestations like palmar erythema might have no direct relationship with the liver. This result is consistent with an earlier report [24]. However, according to the TCM theory, palmar erythema may arise in patients due to the disease in the liver. After the varying prescription, the palmar erythema gradually disappeared, which suggests that the liver function might be restored after treatment by TCM.

The prescription of TCM has a novel approach to treat eczema, which clears the liver heat, dampness and expels the toxins from the liver. It is believed that eczema is often the result of internal and external interactions [19]. Internal factors (chronic digestive system diseases, mental stress, insomnia, excessive fatigue, emotional changes, endocrine disorders, infections, metabolic disorders, etc) and external factors (living environment, climate change, food, etc) can greatly impact the occurrence of eczema [19].

In this case, we employed the method of clearing liver heat by *long dan xie gan tang*, since we observed a red and a yellow coat on the tongue, as well as a string-like pulse. Moreover, dermatitis was observed which complied with the liver Meridian, indicating liver heat and dampness syndrome. The prescription mainly comprises Gentianae Radix et Rhizoma (*longdan*), which is a famous herb to clear liver heat and dampness; Rehmanniae Radix (shengdihuang), Scutellaria baicalnsis Geprgi (huangqin), and Gardenia jasminoides Ellis (zhizi) can clear heat and dampness; Alismatis Rhizoma (zexie), Plantago asiatica L. (cheqianzi) and Clematis armandii Franch. (mutong) are responsible to remove dampness and water from the body [25]. With the use of both internal and external prescriptions, the patient could be rapidly recovered.

From the modern point of view, the liver is responsible for the detoxification of toxins and drugs. In this present case, clearing the liver of heat and dampness in TCM can be a possible novel approach to treat recurrent eczema. Therefore, despite the use of employing emollient or corticosteroid as a topical treatment for eczema, clearing heat and dampness in a liver meridian can be a novel protocol for severe dermatitis. Hence, this method is encouraging and can be promoted in the TCM clinic for eczema treatment.

Conclusion

In this case, TCM was proven to be an effective intervention of eczema, in addition to contemporary treatment in Western medicine. Within few months, the patient was completely recovered from the severe chronic dermatitis and palmar erythema by the treatment with *long dan xie gan tang*, notably, it had no side effects on the patient. It is firmly believed that the TCM liver is an important organ for ensuring the removal of toxins and cleaning of liver heat and dampness. Hence, treatment of TCM liver may lead to the improvement of the normal functions and treatment of the skin diseases.

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