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A Comprehensive Review of Chinese Herbal Formulations for the Treatment of Atopic Dermatitis

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Abstract

Atopic dermatitis (AD) is a common, chronic, and relapsing inflammatory skin disorder characterized by skin irritation and intense pruritus, which significantly impairs the quality of patients' life. Traditional Chinese medicine (TCM) has a long history in the treatment of atopic dermatitis, especially in preventing disease recurrence, minimizing adverse reactions and alleviating disease burden. In this paper, we reviewed the clinical anti-AD efficacy of Chinese herbal formulae from the perspective of AD mechanisms. Following assessment indicators were used: SCORing Atopic Dermatitis (SCORAD), erythema intensity, skin quality of life index (DLQI), pruritus intensity and frequency, transdermal dehydration (TEWL), and AD-mediated chemokine expression levels as index formulae. We also summarize the pharmacological effects of single herbs in the formulae. In conclusion, TCM has significant clinical efficacy for patients of all ages, both as a standalone treatment and in combination with other therapies.

Keywords: Atopic Dermatitis, Ransdermal Dehydration, Iimmunoglobulin E

1. Introduction

AD is a chronic, relapsing inflammatory skin disorder that affects up to 30% of children and 2–10% of adults. Common clinical manifestations of AD include xerosis (dry skin), inflammation, intense pruritus (itchiness), and skin irritation. Persistent scratching caused by pruritus often leads to recurrent rashes, erythematous plaques, and papules. These conditions have been shown to significantly impair patients' quality of life. Over the past decade, the prevalence of AD has remained consistently high, with a rising incidence particularly among pediatric and elderly populations. AD is associated with a wide range of comorbidities, including allergic conditions, psychological disorders, infections, and cardiovascular complications. Globally, AD carries the highest disease burden among dermatologic conditions.

The pathophysiology of AD is complex and multifactorial, involving epiderma l barrier dysfunction, cell-mediated immune responses, immunoglobulin E (IgE) -mediated hypersensitivity and so on. The genetic predisposition, environmental influences, and substantial inter-individual are highly variability. Although both impaired skin barrier function and immune dysregulation are recognized as central to the pathogenesis of AD, definitive evidence identifying the primary initiating factor remains elusive.

2. Pathological Characteristics of AD

2.1 Cutaneous Permeability Barrier Dysfunction in AD

The protective function of the skin is primarily attributed to the outermost layers of the epidermis, particularly the stratum corneum (SC). The SC consists of approximately 18–20 layers of keratinocytes as a physical barrier against mechanical insults. The presence of secretory organelles, known as lamellar bodies (lamellose), has also been observed. These release their lipid-rich content into the intercellular space. In this compartment, hydrolytic are activated and catalyze the conversion of polar lipids into hydrophobic components, which are essential for maintaining the structural integrity of the SC.

Within the stratum corneum, multiple layers of enucleated corneocytes are embedded in an extracellular lipid matrix composed primarily of ceramides, cholesterol, and free fatty acids. These lipids are organized into lamellar structures that form both the physical and permeability barriers of the skin, effectively preventing transepidermal water loss. In addition, keratinocytes play a critical role in innate immunity by synthesizing, storing, and activating antimicrobial peptides. These peptides enhance antimicrobial defense, limit the penetration of toxins, allergens, and pathogens, and support the colonization of commensal, non-pathogenic microbes.

Disruption or alteration of any component of the epidermal barrier can compromise cutaneous integrity. The skin maintains its protective function through a tightly regulated differentiation process designed to resist sustained damage. There is a compelling body of evidence that supports the notion of a significant genetic predisposition in the development of AD. Twin studies have demonstrated concordance rates of 0.72–0.86 in monozygotic twins and 0.21–0.23 in dizygotic twins, indicating a significant genetic contribution, while also highlighting the role of environmental factors in genetically susceptible individuals [1].

Mutations in the human filaggrin gene (FLG), which encodes the essential skin barrier protein filaggrin, represent the most significant of the genetic risk factors identified thus far. In patients with moderate to severe AD, 45.7% to 56.6% carry one or more *FLG*-null mutations, with an estimated population attributable risk of 4.2% to 15.1%. On a broader scale, *FLG* mutations have been implicated in approximately 50% of moderate to severe AD cases and up to 15% of mild to moderate cases [2].

Filaggrin plays a critical role in the formation and function of the SC barrier, contributing to hydration, pH regulation, and the production of intracellular metabolites. *FLG* mutations lead to diminished levels of filaggrin and its degradation products, which are collectively referred to as natural moisturizing factor (NMF). A decline in NMF levels result in increased transepidermal water loss and elevated SC pH, thereby impairing barrier function. As a result, skin with impaired barriers is more susceptible to colonization and infection by Staphylococcus aureus, which can further compromise the integrity of skin barrier. S. aureus not only causes direct damage to the skin barrier but also secretes exotoxins that activate immune responses to allergens penetrating the compromised skin. This potentially led to inflammation and systemic IgE sensitization.

Importantly, *FLG* mutations alone do not invariably result in AD. Individuals who carry same heterozygous or homozygous *FLG* mutations may exhibit reduced filaggrin expression without developing inflammation. In AD patients, barrier dysfunction is characterized by filaggrin deficiency in addition to a range of abnormalities, including impaired keratinocyte differentiation, epidermal hyperplasia, and altered lipid composition.

2.2 Immune Dysregulation in AD

The immune dysregulation hypothesis posits that the pathogenesis of AD is primarily driven by abnormalities in the adaptive immune system. Key contributors include T-helper cell (Th1/Th2) imbalance, elevated IgE production, dysregulated dendritic cell signaling, and hyperactive mast cells. Th1 cells secrete interleukin-12 (IL-12) and interferon-γ (IFN-γ), which are commonly associated with inflammatory bowel disease (IBD), psoriasis, and other autoimmune conditions. In contrast, Th2 cells have been shown to produce IL-4, IL-5, and IL-13, which promote B-cell–mediated IgE production and humoral immunity.

In AD, the cytokine profile of T cells in lesional skin undergoes a transition from a Th2-dominant response in the acute phase to a mixed Th1/Th2 profile in the chronic phase. It is noteworthy that in chronic AD, the activation of Th2 and Th22 responses persists in conjunction with a pronouncedTh1 component, as opposed to being replaced by Th1 dominance. Histopathological features of acute and chronic AD frequently coexist, especially in moderate-to-severe cases, thus blurring the distinction between disease phases.

The immunopathogenesis of AD is primarily driven by robust activation of type 2 (IL-4, IL-5, IL-13, IL-31) and type 22 (IL-22) immune responses in both the skin and circulation. Within the group of type 2 cytokines, IL-4 and IL-13 have been shown to play central roles by promoting B cell recruitment and activation, ultimately enhancing IgE production. Furthermore, IL-4 also induces the differentiation of naïve T cells into Th2 cells, which subsequently secrete IL-4, IL-13, IL-5, and IL-9. Both IL-4 and IL-13 facilitates immunoglobulin class switching from IgM to IgE. The resultant IgE binds to high-affinity receptors (FcεRI) on basophils and mast cells, thereby linking the adaptive immune response (Th2 cells and B cells) with the innate immune system (basophils and mast cells). Notably, basophils, which are typically absent in healthy skin, infiltrate AD lesions and contribute to further exacerbating inflammation.

IL-31, a key Th2 cytokine, exerts a synergistic effect in conjunction with IL-4 and IL-13, thereby inducing pruritus, inflammation, and disruption of the epidermal barrier [3, 4]. Upon IgE-mediated activation, mast cells secrete IL-31, which induces itch and other allergic manifestations. Activation of the IL-31 receptor on eosinophils further

amplifies inflammation by stimulating the release of pro-inflammatory cytokines and chemokines, including IL-6, IL-8, IL-16, IL-32, CXCL1, CXCL8, CCL18, and multiple matrix metalloproteinases. This process contributes to extensive skin inflammation and tissue remodeling. Additionally, the mitogen-activated protein kinase (MAPK) and nuclear factor-κB (NF-κB) signaling pathways are pivotal in the AD pathogenesis, with MAPK playing a central role in transducing extracellular inflammatory signals.

2.3 The "Outside–Inside–Outside" Model of AD

In majority of cases of AD, aetiology is multifactorial, involving a combination of genetic skin barrier defects and immune dysregulation, both of which are strongly influenced by environmental factors. The "outside–inside–outside" model integrates these elements (Figure 1), proposing that genetic and environmental interactions lead to disruption of the skin barrier. This disruption increases permeability to external antigens, which subsequently interact with keratinocytes and dendritic cells, triggering the release of cytokines and chemokines that initiate local inflammation. In turn, local type 2 cytokines further impair the expression of skin barrier proteins and reduce stratum corneum lipid content, thereby exacerbating barrier dysfunction and driving disease progression.

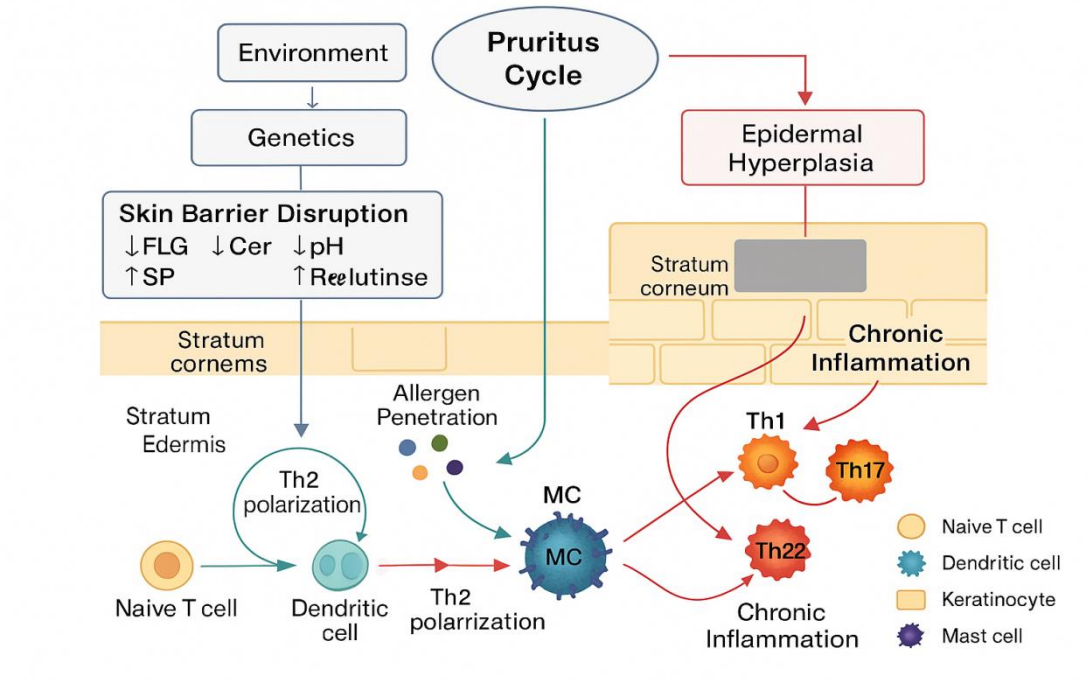

Figure 1. Skin barrier dysfunction and immune response in AD

3. Therapeutic Strategies for AD and the Potential of Herbal Medicines

AD is part of the atopic disease spectrum, which includes food allergies, allergic asthma, and allergic rhino conjunctivitis all of which are associated with significant comorbidities. Currently, AD is primarily managed as a dermatological condition, with treatment strategies aimed at restoring skin barrier function and modulating dysregulated immune responses. Topical anti-inflammatory therapy remains the first-line treatment. Common topical treatments include corticosteroids, calcineurin inhibitors such as tacrolimus and pimecrolimus, and the phosphodiesterase 4 inhibitor crisaborole. In moderate-to-severe cases, systemic agents such as cyclosporin A, methotrexate, azathioprine, mycophenolate mofetil, and ultraviolet phototherapy are recommended.

Recent therapeutic advances have introduced targeted biologics and small-molecule drugs. The anti-IL-4 receptor α monoclonal antibody dupilumab (FDA-approved in 2016; EMA-approved in 2017), the Janus kinase (JAK) inhibitor baricitinib (EMA-approved in 2020), and the anti-IL-13 monoclonal antibody tralokinumab (EMA-approved in 2021) represent significant milestones in the treatment of AD. Dupilumab and tralokinumab exemplify targeted immunotherapies that block specific cytokines or their receptors, whereas baricitinib acts broadly by interfering with intracellular signaling pathways linked to multiple cytokine receptors and immune cascades.

Despite these advances, no definitive cure for AD currently exists. Moreover, almost all available treatments are associated with adverse effects, including an increased infection risk, adrenal suppression, skin atrophy, striae, and

burning or stinging sensations. These side effects frequently result in diminished patient adherence and limit the long-term feasibility of therapy. As a result, there is increasing interest in natural herbal remedies as alternative or complementary approaches to improve efficacy, reduce side effects, and enhance patient compliance. A wide range of medicinal plants and their extracts have been utilized, alone or in combination-to alleviate symptoms, reduce disease severity, and inhibit disease progression.

4. Clinical Evidence Supporting Herbal Medicines in AD

4.1 Topical Application of TCM Formulations

4.1.1 Angelica Yinzi (AYZ)

AYZ is a compound formula composed of 11 herbs, including Angelica sinensis, Radix Paeoniae Alba, Fructus Tribuli, Rhizoma Chuanxiong, Radix Rehmanniae, Herba Schizonepetae, Polygonum multiflorum, Radix Astragali, Rhizoma Anemarrhenae, Radix Glycyrrhizae, and Rhizoma Zingiberis Recens, which together contain 38 chemical constituents such as citric acid, gallic acid, and ferulic acid. Angelica sinensis has a long history of utilisation for its hematopoietic and topical anti-inflammatory properties. In a DNCB-induced murine model of AD, topical application of Angelica sinensis for 11 days lead to a significant reduction in epidermal thickness, mast cell infiltration, and serum IgE levels. In addition, the treatment inhibited scratching behavior and pro-inflammatory cytokines (IL-4, IL-6, TNF-α).

The combination of Rhizoma Chuanxiong and Paeonia lactiflora (XS) has shown notable anti-inflammatory and anti-apoptotic properties. The administration of XS treatment reduced serum levels of IFN-γ, IL-1β, IL-6, and IL-12, accompanied by modulation of the TLR4/MyD88/MAPK/NF-κB signaling pathway. Additionally, the topical application of 1% and 6% R. Paeoniae Alba extracts in murine models reduced scratching behavior, serum IgE, IgG1/IgG2a ratios, and IL-4/IFN-γ expression, indicating a reversal of Th2-skewed immune responses [5]. Schizonepeta tenuifolia exerts anti-inflammatory effects by inhibiting arachidonic acid metabolism products (PGE2, LTB) and oxidative stress mediators (MDA, NO). The methanol extract of Tribulus terrestris has demonstrated antioxidant and anti-apoptotic properties in vitro and in vivo by modulating mitogen-activated pathways.

A clinical trial involving 47 AD patients were compared with a control group (just received loratadine) of patients who received a combination of AYZ and loratadine. The study revealed that the combination therapy was more effective than the use of loratadine alone. The AYZ-treated group demostrated superior improvement rates. Post-treatment serum levels of IL-4 and IL-10 normalized in the AYZ group, while IL-12 levels remained unchanged in the control group. In DNCB-induced AD murine model, AYZ treatment has been observed to result in a reduction in serum IgE and downregulated p-p38, p-p65, p-ERK, and p-JNK, implicating the involvement of the MAPK and NF-κB pathways.

4.1.2 Peitu Qingxin Decoction (PTQXT)

PTQXT comprises nine herbs: Radix Pseudostellariae, Fructus Forsythiae, Uncaria rhynchophylla, Medulla Tetrapanacis, Hyssopus officinalis, Coicis Semen, Dioscorea opposita, Folium Lilii, and Glycyrrhizae Radix. Traditionally, it is used to strengthen the spleen function, eliminate dampness, clear heart fire, and relieve itching. In a 12-week clinical trial involving 275 patients aged 5–25 years, PTQXT-administered alone or in combination with topical traditional Chinese medicine. The results demonstrated that PTQXT was more efficacious than both placebo and 1% mometasone furoate in reducing disease severity and improving quality of life [6]. U. rhynchophylla may alleviate atopic dermatitis (AD)-like symptoms by modulating Th1 immune responses, while F. Forsythiae inhibits T cell proliferation and reduced IL-4 production. These findings indicate that PTQXT may contribute to the restoration of Th1/Th2 immune balance, although the precise mechanisms remain to be fully elucidated.

4.1.3 Zemaphyte

Zemaphyte is a polyherbal formulation comprising ten medicinal plants, including Sesamum indicum, Rehmannia glutinosa, Paeonia lactiflora, Clematis species, and Schizonepeta tenuifolia. In a crossover clinical trial involving 40 patients, Zemaphyte did not demonstrate statistically significant improvement over placebo in clinical scores. However, it is important to note that several components of the placebo, such as rosemary and peppermint, possess intrinsic anti-inflammatory and antibacterial properties. Notably, rosemary extract has been shown to suppress Staphylococcus aureus quorum sensing and inhibit RNAIII expression. These findings emphasise the necessity of re-evaluating the therapeutic potential of Zemaphyte in experimental conditions that are subject to greater levels of control.

4.1.4 Indigo Naturalis Ointment

Indigo naturalis, which is derived from Indigofera species, has a long history of traditional use in the treatment of inflammatory skin diseases. In vitro, it suppresses keratinocyte proliferation, enhances differentiation, reduces oxidative stress, and promotes claudin-1 expression, thereby strengthening tight junctions. A 6-week clinical trial demonstrated that Lindioil ointment (indigo-based) significantly reduced eczema area and severity index (EASI) scores (49.9% vs. 19.6% in vehicle controls), confirming its efficacy and safety for mild-to-severe AD [7].

4.1.5 Jaungo

Jaungo is a Korean topical preparation containing Cercis chinensis, Angelica sinensis, sesame oil, beeswax, and lard. The bioactive components, including shikonin, sesamin, and unsaturated fatty acids, exhibit anti-inflammatory, analgesic, and antimicrobial properties. In a randomized controlled trial, patients who applied Jaungo showed significant improvements in EASI, lichenification, and quality-of-life scores in comparison with placebo. IL-17 and IgE levels also decreased significantly, indicating potential efficacy in the treatment of chronic AD, particularly for xerotic manifestations.

4.2 Oral Compound

4.2.1 Longmu Tang

Longmu Tang is composed of Os Draconis (Long Gu; 30 g/126 g), Concha Ostreae (Calcined Mu Li; 30 g/126 g), Forsythia suspensa (Lian Qiao; 15 g/126 g), Massa Medicata Fermentata (Toasted Shen Qu; 15 g/126 g), Poria cocos (Fu Ling Pi; 30 g/126 g), and Radixet Rhizonma Ephedrae (Ma Huang Gen; 6 g/126 g).

The Os Draconis in the compound has good anti-inflammatory and analgesic effects. The anti-inflammatory effect of Os Draconis was observed in the models of xylene-induced mouse ear swelling and acetic acid-induced mouse abdominal capillary permeability increase. The administration of Os Draconis can effectively enhance the pain threshold of mice, as well as inhibit the rate of acetic acid writhing reactions. It can significantly inhibit the ear swelling induced by xylene in mice. It also inhibited the increase of abdominal capillary permeability induced by acetic acid in mice.

The antibacterial activity of Forsythia suspensa extract (FSE) against Escherichia coli K88, Staphylococcus aureus and Salmonella spp. was determined by pore diffusion method and double dilution method. The results showed that FSE exerted a significant inhibitory effect on the growth of these bacteria.

The present study investigates the impact of Poria cocos protein (PCP) c on the expression of IL-4 and IgE in a mouse model of atopic dermatitis. The results demonstrate a substantial reduction in the expression of both IL-4 and IgE following the administration of PCP. PCP significantly increased the expression of CD44 and CD69 on the surface of effector T cells. Furthermore, PCP can also up-regulate the expression of T-bet and STAT4 and the secretion of IFN-γ and IL-2. In addition, oral PCP can significantly reduce the expression of IL-4 and IgE in mouse atopic dermatitis model.

In a single-center, double-blind, randomized, placebo-controlled clinical trial, the subjects in Longmutang granule group took Longmutang granule (9.8 g/ bag) orally with water twice a day for 8 weeks. Each active granule contains 9.8 grams of Longmu decoction, which is equivalent to 126 grams of raw drugs. Placebo granule consists of 5% crude longmu decoction and 95% starch. The results showed that longmu decoction granule can effectively reduce the level of inflammatory cytokines in the serum and improve the severity of symptoms in AD patients, with an effective rate of 70%[8].

4.2.2 Xiaofeng Powder

Xiao-Feng-San (XFS) is a common Chinese herbal preparation, composed of 12 herbs, which is composed of Schizonepeta tenuifolia, Saposhnikovia divaricata, Periostracum Cicadae, Sophora flavescens, Angelica sinensis, Radix Rehmanniae, Rhizoma Atractylodis, Flaxseed, Fructus Arctii, Rhizoma Anemarrhenae, Gypsum Fibrosum, Glycyrrhrizae Radix and Akebia Akebia, which is the most important formulae in the treatment of AD in Taiwan Province. Linet undertook a study of patients with atopic dermatitis, collecting cases from 2002 to 2011 at the Province Chang Gung Memorial Hospital in Taiwan. From 2002 to 2011, a total of 4,145 patients received treatment using traditional Chinese medicine, accounting for 8.8% of the total cases. Of the patients in the study, 2841 (68.54%) opted for simple Chinese medicine treatment and 1304 (31.46%) opted for the combation of Chinese and western medicine treatment. Patients who chose combination therapy were found to be younger, required more frequent visits and longer treatment time, but the side effects were significantly reduced. Xiaofeng powder (16.98%) and Baixianpi (12.68%) were identified as the prescriptions and single drugs with the highest prescription frequency [9].

Sophora flavescens is a commonly used Chinese medicine to treat itching. The active principles are alkaloids and flavonoids. The representative putative targets of alkaloids are inflammation-related proteins (MAPK14, PTGS2, PTGS2 and F2) and pruritus-related proteins (HRH1, TRPA1, HTR3A and HTR6). The representative targets of flavonoids are inflammation-related proteins (TNF, NF-κB, F2, PTGS2 and PTGS2) and pruritus-related proteins (NR3C1 and IL2). RSF inhibits histamine signalling at the transcriptional level in rats sensitised to toluene 2,4-diisocyanate. Moreover, RSF inhibits Th2 cytokine signalling thereby regulating inflammation and itch.

External use of Astragalus membranaceus Fisch (AM) can significantly improve DNCB-induced AD skin lesions in mice. AM inhibited the expression of Th2 cytokines IL-4, -5, -6 and -13, and significantly decreased the level of TNF-α. Nepeta tenuifolia Benth (NT) treatment can inhibit the inflammatory symptoms of AD-like skin lesions induced by the DNCB-induced group exhibited symptoms of dermatitis, while the ST group demonstrated a substantial reduction in epidermis and dermis thickening and proliferation. The dermal application of ST extract can lead to down-regulation of TNF-α, thereby suggesting that ST extract may affect the activation of Th2 cells and Th1 cells. These results indicate that AM and NT have synergistic effects on AD induced by DNCB in mice. Arctium lappa L. inhibits the phosphorylation of MAPKs by activating the transcription of NF-κB , as well as the mRNA expression and protein secretion of IL-4 and IL-5 [10].

In clinical trials, patients took this medicine three times a day. The dosage for patients aged between three and seven years was one packet, two packets for patients aged between eight and 12 years, and three packets for patients aged 13 years and over. Each packet contains either 3 grams of XFS concentrated granules or a placebo. Placebo is composed of caramel, lactose and starch in a ratio of 2:1:1. The reduction in the total lesion score in the treatment group at 8 weeks was significantly greater than that of the placebo group. A statistically significant difference was also identified between the treatment and placebo groups regarding erythema, surface damage, pruritus and sleep scores. Study results indicated that the traditional Chinese herbal medicine XFS may be an alternative choice of therapy for severe, refractory, extensive and nonexudative atopic dermatitis [11].

4.2.3 Qinzhuliangxue Decoction (QZLXD)

A total of 176 patients were enrolled at Shanghai Yueyang Hospital and were randomly divided into two groups: Qingre Jiedu group Qinzuliangue Decotion (QZLXD) (n = 82) and Qingre Jiedu control group Runzaozhiyang Capsules (RZZYC) (n = 86). The EASI, Dermatology Life Quality Index (DLQI), pruritus score, recurrence rate and adverse effevts were compared between the two groups. Subjects were randomly assigned to take 30 mL of QZLXD after meals twice a day (n = 82) or take 4 tablets of RZZYC after meals three times a day (n = 86) and take mizolastine sustained-release tablets every day. After 4 weeks of treatment, the average EASI score and itching score in the treatment group were lower than those in the control group. Moreover, the total effective rate in the QZLXD group was higher than that in the RZZYC group, with a recurrence rate that was similar in both groups. The results indicated that QZLXD demonstrates a favorable therapeutic response, with a low recurrence rate and tolerance of adverse reactions. Thus, it is recommended for the treatment of subacute atopic eczema [12].

4.2.4 So-Cheong-Ryong-Tang

So-Cheong-Ryong-Tang (SCRT, Xiao-Qing-Long-Tang in China or Sho-Seiryu-To in Japan) is the mixture of the following 8 herbs: Epoedrae Herba, Paeoniae Radix Alba, Schizandra e frutus, pinelliae rhizoma, asari herbacum radice, zingiber is rhizoma, cinnamomi ramulus, and glycyrrhizae radix. In a clinical trial, there are 60 patients with AD aged between 7 to 65 years old. Participants will be randomly assigned in a 1:1 ratio to either the SCRT group or the placebo group, and participants will be treated with either SCRT or placebo 3 times a day for 4 weeks. Results have yet to be followed up [13]. SCRT were found to inhibit histamine release and degranulation of mast cells, differentiation of basophils and proliferation of eosinophils. SCRT thus does not appear to inhibit histamine H-1 receptors or information induced by serotonin, PAF, LTC4 and LTD4, but suppresses mast cell activity. Consequently SCRT would thus have only a few side effects.

4.2.5 Danggui Shaoyao Powder

Danggui Shaoyao Powder was first recorded in Zhang Zhongjing's synopsis of the Golden Chamber. It is a well-known prescription in common use. It is composed of six herbs: Angelica sinensis, Rhizoma Ligustici Chuanxiong, Paeonia lactiflora, Poria cocos, Atractylodes macrocephala, and Zedoaria japonica. Atractylodes macrocephala has anti-inflammatory, anti-oxidation, anti-tumor, immunomodulation and liver protection effects. Atractylodes macrocephala polysaccharide significantly promots the production of NO, ROS, cytokines and chemokines, enhances phagocytosis and phagocytosis activity, and up-regulated the expression of auxiliary and costimulatory molecules, among which NF-κB and JAK-STAT signaling pathways played a key role. Alisma orientalis has immune regulation and anti-inflammatory effects [14]. Huang et al. found that the TNF-α content and lung injury score of mice with acute lung injury induced by lipopolysaccharide were significantly decreased after the

intervention of total triterpenoids of Alisma orientalis, which may be related to the inhibition of total triterpenoids of Alisma orientalis on the release of inflammatory mediators in vivo [14].

A clinical study was conducted in which typical cases were collected in the clinic, and the formula of Danggui Shaoyao Powder was used as the basic formula, and the prescription was changed according to the actual clinical situation. The study concluded that the combination of anti-inflammatory and tranquilising herbs had produced satisfactory results, and that the formula had good anti-inflammatory, antioxidant and immunomodulatory properties. The prescription is one dose per day, decocted in water, twice a day, for one month. Danggui Shaoyao Powder, has yielded favourable therapeutic outcomes in all cases.

4.2.6 Compound Fuling Decoction

Compound Fuling decoction is composed of 8 traditional Chinese medicines: Poria cocos, Alisma orientalis, Cortex Phellodendri, Gardenia, Radix Paeoniae Rubra, Duckweed, Angelica sinensis and Glycyrrhiza uralensis,with a total of 14 constituents analysed, of which the main chemical constituents are kynurenine gentian disaccharide glycosides, kynurenine glycosides, paeoniflorin glycosides, and licorice glycosides.

Glabridin in Glycyrrhiza uralensis Fisch can significantly alleviate the skin thickening, scabbing and bleeding on the orsal region of AD mice, and reduce the infiltration of inflammatory cells. The levels of IFN-γ, TNF-α, IL-4, IL-5, IL-6, IL-13 and IgE were found to be significantly decreased by inhibiting phosphorylation of MAPK signaling pathway and activation of NF-κB.

In vivo study, the treatment of water extract of Gardenia jasminoides Ellis significantly reduced the level of IgE and cytokine expression in spleen and serum of mice in the treatment group. In comparison with the negative control group, the mice treated with water extract of Gardenia jasminoides Ellis had less inflammatory cells infiltration in dermis and subcutaneous tissue. The aqueous extract of Gardenia jasminoides Ellis can inhibit the expression of COX-2 and TNF-α, the translocation of NF-κβ and the phosphorylation of Syk, p38, JNK and Erk1/2 in stimulated RBL-2H3 cells. These results strongly suggest that the water extract of Gardenia jasminoides Ellis can inhibit allergic reactions by reducing mast cell activation, which may have therapeutic potential against AD.

The allergic contact dermatitis of mice induced by DNFB was used as an animal model, and the pharmacodynamic indexes of different Chinese medicine combinations (I-IV), hydrocortisone as a positive control and normal saline as a negative control were compared. In Group I, 8 Chinese medicines were Poria, Alisma orientalis, Phellodendron amurense, Gardenia, Paeonia lactiflora, duckweed, Angelica sinensis and Glycyrrhiza uralensis. Group II is the water extracts of Gardenia, Radix Paeoniae Rubra and Radix Glycyrrhizae. Group III is the water extracts of Poria and Radix Angelicae Sinensis. Group IV is the water extracts of Poria, Gardenia, Radix Paeoniae Rubra, Radix Angelicae Sinensis and Radix Glycyrrhizae. Compared with the normal saline group, the serum IFN-γ levels in the hydrocortisone group and the traditional Chinese medicine group were significantly lower. However, no significant differences were observed in the levels of IL-4 and IL-10 in each group. Paeoniflorin, one of the main active ingredients in Compound Fuling Decoction, can inhibit the proliferation of human peripheral blood T lymphocytes co-stimulated by CD3 with CD28 and induce T lymphocyte apoptosis. Paeoniflorin can significantly inhibit the IFN-γ level in the culture medium of human T lymphocytes in a concentration-dependent manner. The anti-inflammatory mechanism may be through inducing T lymphocyte apoptosis and reducing IFN-γ level. Clinical trials have also proved that compound Fuling decoction can effectively relieve itching, significantly improve the symptoms of skin lesions and reduce adverse reactions.

4.3 Compound Combined with Acupuncture

In a clinical trial, 20 patients received acupuncture treatment twice a week (24 times in total). Each course of treatment lasted 35 minutes (the needle was left on the patient for 20 minutes). Chinese medicine was administered in the form of a concentrated powder (1:5), with 3 g added to 50 mL of boiling water, three times a day, in junction with acupuncture treatment. Each patient received a formula from the 39 herbs that were appropriate for or individual TCM diagnosis. At each visit, the patients were evaluated by a TCM practitioner, and the formulas and acupoints for acupuncture were altered according to the patient's clinical condition and based on TCM principles. The most important herbs used in this study were Dicta-mus dasycarpus (Faxinella; Bai Xiab Pi), Lonicera japonica (Lonicera flower; Jin Yin Hua), Paeonia suffruticosa (Moutan; Mu Dan Pi), Polygonum multiflorum (Polygonum stem; Ye JiaoTeng), Rehmannia glutinosa (Rehmannia raw; Sheng DiHuang), and Sophora angustifolia (Sophora Root; Ku Shen). After 12 weeks of treatment, EASI improved in 100% of patients and DLQI and VAS decreased in 78.8% of patients compared with baseline, and no adverse effects were observed. The results of this study suggest that acupuncture combined with traditional Chinese medicine has a good effect on atopic dermatitis, and may be better than traditional Chinese medicine alone [15]. In another single-center, prospective, randomized clinical trial, 30 patients were treated with flying needles combined with traditional Chinese herbs. After 12 weeks

of treatment, all patients' SCORAD scores decreased without any side effects. The results suggest that the combination of flying needles with traditional Chinese herbs has obvious curative effect on atopic dermatitis. This approach may potentially surpass the effectiveness of oral medications as a standalone treatment.

5. Conclusion

AD is a chronic inflammatory disease, and the immune balance between Th1 and Th2, genetic and acquired skin damage are all part of its pathogenesis. The existing western medicines are associated with local or systemic adverse reactions, and researchers have been searching for Chinese herbal medicine as alternative therapies in recent decades. Several clinical experimental studies have confirmed the efficacy of Chinese herbal medicine for patients suffering from AD. Chinese herbal medicine can be used as a supplement or alternative to reduce the dosage of western medicine, thus reducing adverse reactions, and can alleviating symptoms over an extended period, thus significantly enhancing the quality of life of patients. A comparative analysis of the efficacy of traditional Chinese medicine in conjunction with Western medicine reveals its superiority in the treatment of AD. Combination therapy has been shown to enhance both the effectiveness and the curative rate of treatment, while concomitantly reducing the size of the lesions and the severity of pruritus. Moreover, combination of Traditional Chinese medicine with acupuncture and other treatment methods has been shown to achieve more obvious results. However, at present, there is a paucity of clinical trials on the application of Chinese herbs to atopic dermatitis, and the exact mechanism of Chinese herbal medicine needs to be further explored. In accordance with the theory of traditional Chinese medicine, the interaction between excessive heart fire and spleen deficiency is considered to be the primary pathogenesis of AD. Decoction is the most widely used form of medication in traditional Chinese medicine. However, some patients have expressed dissatisfaction with the taste of the decoction, suggesting a need for improvement in its palatability. It is imperative that traditional Chinese medicinal remedies in syrup and granule form are developed, particularly for children.

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