Clinical Observation of Chuanbai Antipruritic Lotion "Water Film" Wet Compress Combined with Chloramphenicol Prednisone Liniment in the Treatment of Acute Eczema

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Abstract [**Objectives**] To observe and analyze the clinical efficacy and possible mechanism of Chuanbai antipruritic lotion "water film" wet compress combined with chloramphenicol prednisone liniment in the treatment of acute eczema. [**Methods**] A total of 76 acute eczema cases admitted to Shiyan Taihe Hospital from January 2022 to March 2023 were divided into Western medicine treatment group and integrated traditional Chinese and Western medicine group. In the Western medicine treatment group, chloramphenicol and prednisone liniment was applied to the skin lesions and oral administration of cetirizine hydrochloride. The course of treatment in both groups was 2 weeks (w). The levels of interferon-γ (IFN-γ), interleukin-4 (IL-4) and the ratio of IFN-γ/IL-4 in the peripheral blood of patients before and 2 weeks after treatment, as well as serum immunoglobulin E (IgE), anti-IgE antibody and histamine (HA) level, and with skin lesions disappearing time, skin oil, transepidermal water loss (TEWL), eczema area and severity index (EASI) score, total effective rate, degree of pruritus and traditional Chinese medicine quality of life scale (EPQOLS) score to evaluate the efficacy. [**Results**] Compared with the Western medicine treatment group at 2 w, the disappearance time of skin lesions in the integrated traditional Chinese and Western medicine group was shortened, TEWL, itching degree and EASI score, serum IgE and HA, and peripheral blood IL-4 levels were all decreased ($P < 0.05$). IFN-γ and IFN-γ/IL-4 ratio, anti-IgE antibody, EPQOLS score and total effective rate were all increased ($P < 0.05$), and the difference was statistically significant. [**Conclusions**] Chuanbai antipruritic lotion "water film" wet compress combined with chloramphenicol prednisone liniment is an optimized and safe and efficient method for the treatment of acute eczema, which can quickly relieve the symptoms of inflammatory damage of eczema and restore the skin barrier function, dry dampness and relieve itch. Inhibition of the release of histamine active substances and regulation of immunity may be the main mechanisms.

Key words Acute eczema, Chuanbai antipruritic lotion, Chloramphenicol and prednisone liniment, Dampness and itching, Histamine, Immunoglobulin E

1 Introduction

Acute eczema (AE) falls into the category of "damp-heat immersion syndrome", and it is often caused by "weak endowment, improper diet" and injury to the spleen and stomach[1]. *Chao Yuan Soaked Sores* recorded that "soaked sores originated in the skin, very small at birth, first itching and then pain into sores, juice out, impregnated muscles, soaked gradually wider, all over the body"[2]. The onset of acute eczema is closely related to allergic reactions and immune dysfunction[3]. Symptomatic treatment such as topical glucocorticoids or oral antihistamines is usually used, which has obvious efficacy but high side effects and recurrence rate[4]. Chuanbai antipruritic lotion has the effect of "dissipating wind and stopping sudden exhaustion, drying dampness and detoxifying"[5]. In this study, "water film" wet compress combined with chloramphenicol prednisone liniment was used to treat acute eczema.

2 Data and methods

2.1 Clinical data 76 patients with acute eczema admitted to Dermatology Department of Shiyan Taihe Hospital from January 2022 to February 2023 were selected and divided into Western medicine treatment group and integrated Chinese and Western medicine treatment group according to the order of admission and the principle of random blind method, with 38 cases in each group. In the Western medicine treatment group, there were 21 males and 17 females, with an average age of (35.85 ± 7.01) years and an average duration of (5.25 ± 2.87) years. There were 20 males and 18 females in the group with an average age of (34.96 ± 8.05) years and an average course of disease of (5.14 ± 2.03) years. There was no significant difference in age, gender and average course of disease between the two groups ($P > 0.05$), indicating comparability. This study complies with the regulations of the Ethics Committee of Shiyan Taihe Hospital, and all subjects included in this study are aware of the test indicators and sampling methods of this study and have signed informed consent.

2.2 Diagnostic criteria Western diagnostic criteria are formulated according to the diagnostic criteria of "acute eczema" in the *2011 Eczema Diagnosis and Treatment Guide*[6]. The diagnostic criteria of TCM are drawn up with reference to the diagnostic criteria of "dampness-heat immersion syndrome" in the *Expert Consensus of TCM Diagnosis and Treatment of Eczema (Wet Sore) (2016)*[7].

2.3 Inclusion and exclusion criteria Inclusion criteria: (i) Meeting the above diagnostic criteria of Chinese and Western medicine; (ii) age 16 - 59 years old; (iii) the skin area is less than 3% of the body surface area; (iv) patients give informed consent to treatment and sampling and sign informed consent; (v) no allergic history of drugs used in this treatment regimen and no inter-

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nal or external steroid hormones or antihistamines taken within the past 1 month.

Exclusion criteria: those who did not meet the above conditions (i) – (v) and those with severe liver and kidney diseases and pregnant and lactating women were excluded.

2.4 Case screening and exclusion criteria (i) Patients with allergies or other serious complications during the course of receiving this treatment regimen; (ii) patients who could not complete the course of treatment and could not comply with the study or the treatment and their families raised objections and requested withdrawal.

2.5 Treatment methods All patients in the two groups received basic treatment: cetirizine hydrochloride tablets were orally given, 10 mg/time, once/day after dinner, for 2 weeks (w). Western medicine treatment group: apply chloramphenicol prednisone liniment to skin lesions, twice a day, a total of 2 w; on this basis, the Western medicine combination group added Chuanbai antipruritic lotion "water film" wet compress. The original liquid of Chuanbai antipruritic lotion was diluted with normal saline for injection at a ratio of 1∶1, and the sterile medical gauze was immersed in the liquid. Use a medical cotton swab to clean the liniment of chloramphenicol prednisone applied on the skin, remove the gauze, cut the size of the eczema skin area, and then cover the skin area to form a "water film" of the liquid. Wet compress 60 min/time, twice/day, a total of 2 w. Note: chloramphenicol prednisone liniment and liquid "water film" wet compress alternate.

2.6 Venous blood sampling and observation indicators (i) Fasting venous blood was taken from patients before treatment and 2 weeks after treatment for reserve; (ii) serum anti-IgE antibody, histamine (HA), peripheral blood interferon-γ (IFN-γ), interleukin-4 (IL-4) levels were analyzed by enzyme-linked immunosorbent assay before treatment and at 2 w, and IFN-γ/IL-4 ratio was calculated. Serum immunoglobulin E (IgE) levels were detected by rate scattering turbidimetry.

2.7 Skin function index detection of transepidermal water-loss (TEWL) Epidermal water content was measured with Japanese Sclar water pen and Tewameter TM instrument. The skin oil content was measured by submeter of CK company in Germany. Take the mean of the same part three times.

2.8 Eczema area and severity index (EASI) EASI evaluation includes skin area and clinical signs, EASI = clinical symptom score + skin area score. EASI is an important index to evaluate the severity of skin lesions. The higher the score, the more severe the lesions[8].

2.9 Itchiness and Chinese medicine Quality of Life Scale (EPQOLS) score: (i) assessment of itchiness: itchiness was graded at 5 levels and evaluated with reference to linear scoring method; (ii) assessment of EPQOLS: using the 4-level scoring method of the Simplified Chinese version of Skin Disease Patients Quality of Life Scale, the higher the score, the worse the quality of life[9].

Efficacy index = [(EASI before treatment – EASI after 2 w)/EASI before treatment] × 100%.

Cure: efficacy index ≥ 90%, skin healing, skin rash disappeared and no itching. Efficacy: 60% ≤ efficacy index < 90%, skin area reduction > 60%, skin redness, exudation and itching significantly reduced. Improvement: skin redness, swelling, exudation and itching were reduced, 20% ≤ efficacy index < 60% and skin area was reduced > 30%. Ineffective: efficacy index < 20%, pruritus, redness, and exudation did not improve or even worsen[10].

2.10 Safety evaluation To observe whether clinical adverse reactions (such as allergy, drug rash, dizziness, headache, drowsiness, dry mouth, abdominal discomfort, agitation), liver and kidney function and other adverse events occurred during the course of treatment and 1-month follow-up to evaluate the safety of treatment.

2.11 Statistical processing SPSS 21.0 statistical analysis software was used to process the data. The statistical data were measured by χ^2 test. Measurement data were expressed as ($x \pm s$), and T-test was used for comparison between groups. $P < 0.05$ was considered statistically significant.

3 Results and analysis

3.1 Changes in of venous blood indicators in the 2 groups before treatment and at 2 w The results are shown in Table 1. Compared with the same group before treatment, serum IgE and HA, peripheral blood IL-4 levels were decreased in the Western medicine treatment group and the integrated Chinese and Western medicine group, and peripheral blood IFN-γ, IFN-γ/IL-4 ratio and anti-IgE antibody were increased ($P < 0.05$), the difference was statistically significant. Compared with the Western medicine treatment group for 2 w, serum IgE and HA, peripheral blood IL-4 levels were decreased in the integrated Chinese and Western medicine group, and peripheral blood IFN-γ, IFN-γ/IL-4 ratio and anti-IgE antibody were increased ($P < 0.05$), with statistical significance.

Table 1 Comparison of IgE, HA, IL-4, IFN-γ, IFN-γ/IL-4 and anti-IgE antibodies between the two groups ($n = 38$, $x \pm s$)

Group	Treatment time	IgE//mg/L	anti-IgE antibody//mg/L	HA//ng/L	IFN-γ//pg/mL	IL-4//pg/mL	IFN-γ/IL-4//%
Western medicine treatment	Pre-treatment	1.03 ± 0.22	0.94 ± 0.16	3.91 ± 0.24	32.53 ± 4.12	53.27 ± 2.17	60.03
	2 w	0.87 ± 0.12[a]	1.24 ± 0.11[a]	2.25 ± 0.141[a]	49.20 ± 3.52[a]	45.50 ± 2.59[a]	108.81[a]
Integrated Chinese and	Pre-treatment	1.04 ± 0.18	0.97 ± 0.19	3.89 ± 0.28	33.06 ± 1.09	54.01 ± 3.49	61.42
Western medicine	2 w	0.75 ± 0.09[ab]	1.45 ± 0.24[ab]	1.94 ± 6.18[ab]	52.23 ± 3.96[ab]	40.84 ± 3.04[ab]	131.54[ab]

Note: Compared with the group before treatment, [a]$P < 0.05$; compared with Western medicine treatment group for 2 w, [b]$P < 0.05$.

3.2 Improvement of symptoms in the 2 groups The improvement of symptoms in the 2 groups was compared with that before treatment in the same group, the disappearance time of skin lesions in the Western medicine group and the integrated Chinese and Western medicine group was shortened, TEWL, itching, EASI score, EASI score and EPQOLS score were decreased, and the skin oil and efficacy index were increased ($P<0.05$), with statistical significance (see Table 2). Compared with 2 w before treatment and Western medicine treatment group, the disappearance time of skin lesions in integrated Chinese and Western medicine group was shortened, TEWL, itching, EASI score, EASI score and EPQOLS score were decreased, and skin oil and efficacy index were increased ($P<0.05$), with statistical significance (see Table 2-3).

Table 2 Comparison of itching, EPQOLS and EASI scores before treatment and at 2 w between the two groups ($n=38$, $x\pm s$, score)

Group	Treatment time	Itching degree	EPQOLS	EASI
Western medicine treatment	Pre-treatment	3.02±0.46	9.25±1.02	7.53±0.32
	2 w	0.64±0.19[a]	2.27±0.22[a]	1.41±0.12[a]
Integrated Chinese and Western medicine	Pre-treatment	3.01±0.32	9.27±0.81	7.76±0.29
	2 w	0.37±0.09[ab]	1.01±0.08[ab]	0.72±0.06[ab]

Note: Compared with the group before treatment, [a]$P<0.05$; compared with Western medicine treatment group for 2 w, [b]$P<0.05$.

Table 3 Comparison of 2 w skin disappearance time, TEWL and efficacy index between the two groups ($n=38$, $x\pm s$)

Group	TEWL[g/(h·cm^2)]	Loss time//d	Skin oil//μg/cm^2	Efficacy index//%
Western medicine treatment	24.57±3.07	8.61±0.54	80.61±5.06	81.27
Integrated Chinese and Western medicine	18.65±2.55[b]	7.14±0.71[b]	97.35±4.14[b]	93.02[b]

Note: [b]$P<0.05$ compared with Western medicine treatment group for 2 w.

3.3 Comparison of clinical efficacy of the two groups The total effective rate of the Western treatment group was 81.57%, and the total effective rate of the integrated Chinese and Western medicine group was 94.73%. By χ^2 test ($\chi^2=11.471$), the combined Chinese and Western treatment group was compared with the Western treatment group ($P<0.05$), and the difference was statistically significant (see Table 4).

Table 4 Comparison of clinical efficacy between the two groups ($n=38$, %)

Group	Recovery	Apparent response	Improvement	Ineffectiveness	Total response rate//%
Western medicine treatment	17	14	6	1	31 (81.57)
Chinese and Western medicine	23	13	2	0	36 (94.73)[b]

Note: Compared with Western medicine treatment group, [b]$P<0.05$.

3.4 Safety evaluation In this study, no allergy or drug rash occurred in patients in both groups after receiving corresponding treatment and during 1-month follow-up, and the incidence of adverse reactions such as dizziness, headache, drowsiness, dry mouth, abdominal discomfort and agitation were not statistically significant ($P>0.05$). Liver and kidney function was normal at 2 w in both groups, and no other adverse events occurred. It is suggested that the treatment is safe.

4 Discussion

The causes of eczema are complex, and most doctors in the past believed that the onset of eczema is related to the interaction of external causes (dampness, wind and heat pathogens soaking the skin) and internal causes (lack of innate endowments, deficiency of spleen and liver)[11]. In this study, acute eczema with "dampness-heat intoxicating syndrome" was taken as the object of study. The combination of dampness-relieving lotion "water film" and chloramphenicol prednisone liniment was used as the intervention method, and cetirizine hydrochloride tablets were given orally to treat both internal and external symptoms and root causes, so as to achieve the therapeutic purpose of clearing heat, drying dampness and relieving itch.

It has been reported that the prevalence rate of adult eczema exceeds 10% and is on the rise year by year. With the development of a new medical model: "physiology-psychology-society", paying attention to the impact of the disease on patients' psychology and quality of life is also of certain significance in treatment[12]. The results of this study showed that the disappearance time of skin lesions was shortened, TEWL, itching degree, EASI score, EASI score and EPQOLS score were decreased, and skin oil and efficacy index were increased in the integrated Chinese and Western medicine group. It is suggested that the combination of traditional Chinese medicine and Western medicine has certain advantages in improving symptoms and quality of life of patients.

Studies have shown that cytokine IL-4 mediates delayed hypersensitivity and promotes inflammatory cell infiltration[13]. The secretion of IFN-γ can inhibit the secretion of inflammatory mediators such as IL-4 by Th2 cells, and reduce or inhibit allergic reactions, so the increased release of IFN-γ can be considered as an effective control of eczema. Mast cell degranulation releases histamine bioactive substances, resulting in allergic reactions, and mast cell degranulation releases inflammatory mediators, resulting in type 1 allergy immune damage mainly manifested in mucous membranes or skin, which is a direct factor leading to skin lesions[14].

In this study, the reduction of HA was mainly attributed to cetirizine hydrochloride, while glucocorticoids in chloramphenicol prednisone liniment also played an important role in stabilizing lysosomes, inhibiting mast cell degranulation and thus reducing the

release of histamine inflammatory mediators. IgE is also involved in the formation of abnormal immune response and an important part of inflammation in the skin, and it also activates mast cells and causes them to release histamine, leukotriene and other mediators[15]. The increased level of anti-IgE antibody in patients indicated that IgE involved in the formation of abnormal skin immune response was effectively inhibited. Chloramphenicol prednisone linimentum can inhibit mast cell activation in this inflammatory response, while cetirizine hydrochloride, as an H1 receptor antagonist, can inhibit mast cell and basophil degranulation, both of which play an important role in inhibiting mast cell degranulation release of inflammatory mediators and alleviating acute inflammatory skin injury of eczema. In the drug composition of Chuanbai antipruritic lotion, "*Portulaca oleracea*, snake seed, *Sophora flaveskeli*, white moss skin, *Radix Nepeta*, Baibu, honeycomb, mugwort leaf, Chuanligong, locust twig, Xihe willow, willow twig, *Tribulus tribulus*, peach twig" are used together to make "water film" wet compress, and the formed "water film" wet package can be absorbed through the skin to jointly play the effect of "clearing heat, drying dampness and relieving itch"[16].

To sum up, Chuanbai antipruritic lotion "water film" wet compress combined with chloramphenicol prednisone liniment treatment has played a role in treating both symptoms and root causes, the clinical effect of patients is increased with no allergy, drug rash, *etc.*, to achieve the purpose of "decreasing side effects and enhancing effect" in safe drug use.

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