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Original Article

Combination of Qinzhu Liangxue Decoction and acitretin on the treatment of psoriasis vulgaris: a randomized controlled trail

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Abstract: Objective: To explore the clinical efficacy and safety of acitretin plus Qinzhu Liangxue Decoction in the treatment of psoriasis vulgaris. Method: A total of 72 eligible patients with psoriasis vulgaris were enrolled and randomized to into the acitretin group and the acitretin plus Qinzhu Liangxue Decoction group. The clinical efficacy and laboratory tests were measured at baseline and at 4 or 8 weeks. Results: Both initial PASI (psoriasis area and severity index) and DLQI (Dermatology Life Quality Index) were significantly decreased in two groups at 4 and 8 weeks. There was a better improvement of PASI or DLQI in the experimental group than those in the control group at 8 weeks. However, there was no significant difference in the DLQI improvement between two groups at 4 weeks. Compared with the control group, the treatment success rates in the experimental group was significant higher after 8 week of treatment. The serum levels of tumor necrosis factor-α (TNF-α), interleukin-8 (IL-8), IL-22, macrophage inflammatory protein-1α (MIP-1α), MIP-1β and monocyte chemoattractant protein-1 (MCP-1) were dramatically declined both two groups at week 4 and week 8. The TNF-α, IL-8, IL-22, MIP-α, MIP-β and MCP-1 levels in the experimental group were significantly lower than those of control group 4 weeks or 8 weeks after treatment. Conclusion: Combination of acitretin with Qinzhu Liangxue Decoction have an exactly therapeutical efficacy in the psoriasis vulgaris associated with the negative regulation of TNF-α, IL-8, IL-22, MIP-1α, MIP-1β and MCP-1.

Keywords: Psoriasis vulgaris, acitretin, qinzhu Liangxue decoction, psoriasis area and severity index, dermatology life quality index

Introduction

Psoriasis is considered as a chronic, relapsing and immunological skin disease. The global prevalence of psoriasis is about 3-4% of the general population worldwide [1]. Psoriasis is predominantly involved in the skin, nails, and joints [2] and clinically presents papules, plaques, red and scaly patches with varying severity ranged from localized patches to systemic coverage [3]. Psoriasis vulgaris is the most common form of psoriasis that accounts for 80-90% of patients with psoriasis [4]. Psoriasis is indicated to have a profound impact on the physical and psychosocial quality among many affected patients [5]. However, it is still largely unknown the etiology of psoriasis associated with multifactorial mode of inheritance [6]. It is identified to be a complex condition whereby the normal skin cells are recognized as pathogen that evoking the inflammatory reaction when psoriasis develops [7]. The complementary and alternative medicine therapies are major approaches in the treatment of 51% of psoriasis, but limited efficacy was observed with regard to these treatments [8]. In addition, the chronically used systemic drugs during the course of psoriasis therapy is identified to exert potential organ toxicity, increased risk of malignancies or malignancies, as well as high costs, bring great mental burden and economic pressure to psoriasis patients [9, 10].

To date, a plenty of treatments are used for inhibition of epidermal hyperproliferation or prevention of skin inflammation in psoriasis pa-

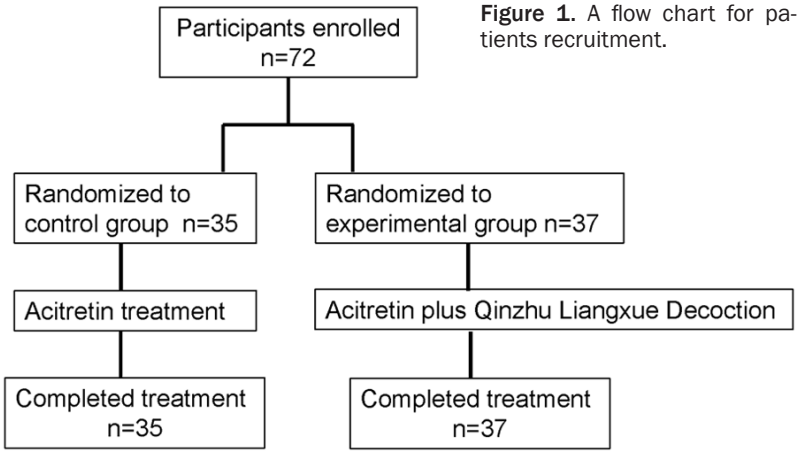

Figure 1. A flow chart for patients recruitment.

tients. Systemic treatments with retinoids such as acitretin have been available for therapy of psoriasis, but the associated mechanisms are still largely unknown [11]. Acitretin is recognized as a common and effective agent in the treatment of moderate or severe patients with psoriasis vulgaris. However, acitretin is found to be a teratogen that induces dyslipidemia during the treatment course, greatly limited its clinical application [4]. Psoriasis always has a relapse after cessation of therapy. Accordingly, a long-term therapy and close follow-up of possible side effects in patients with psoriasis are necessary. The application of a Chinese herbal medicine (CHM) has successfully improved the efficacy of psoriasis vulgaris treatment in recent years [12]. The use of CHM can be dated back to about 5000 years ago [13]. The topical or oral administration of CHM is clinically used to psoriasis vulgaris treatment in forms alone, or alongside conventional therapies [14]. A previous systematic review indicates that combined application of CHM may augment the overall effectiveness, and reduce adverse effects in pharmaceutical drugs-treated psoriasis vulgaris patients [12].

Qinzhu Liangxue Decoction is complex prescription traditional Chinese medicine with liver protection and dispelling wind, clearing heat and cooling blood, relieve itching and pain. Its indications include herpes zoster, flat wart and itching skin disease [15]. However, it is still unclear that whether the combining oral of Qinzhu Liangxue Decoction with conventional pharmacotherapy have a therapeutical effect in the psoriasis vulgaris. Therefore, we evaluated the efficacy and safety of Qinzhu Liangxue Decoction plus acitretin for the treatment of psoriasis vulgarisn a randomized and parallel-group clinical trial.

Materials and methods

Patients

This randomized and parallel-group clinical study was performed at affiliated Yantai Yuhuangding Hospital of Qingdao University Medical College in China. This study protocol was approved by the Ethics Committee of the affiliated Yantai Yuhuangding Hospital of Qingdao University Medical College. All patients signed an informed consent to participate in study. All experiments were performed in accordance with relevant guidelines and regulations. A total of 72 patients with psoriasis vulgaris from September 2011 to June 2013 were eligible to enroll in the study (**Figure 1**). All 72 cases were consistent with diagnosis standard for psoriasis vulgaris in west medicine. The patients enrolled in this study is conformed with the following eligibility criteria: 1) age is not less than 18 years; 2) histologically confirmed psoriasis vulgaris; 3) no abnormal physiology dysfunction; 4) normal biochemical analysis tests; 5) patients had a greater than 10 in PISA score; 6) patients had not been received any systemic therapy at least 6 months before this study. The exclusion criteria were the following: 1) patients who had a history of skin cancer or solar keratoses; 2) patients who had suffer localized palmoplantar psoriasis, liver diseases, hyperlipoproteinaemias, cardiac or neurological diseases; 3) age is not more than 18 years; 4) patients who have receiving systemic therapy; 5) pregnant or lactating women; 6) patients with infection diseases, such as HIV, hepatitis B virus, hepatitis C virus; 7) patients with allergies to acitretin.

Study procedures

The enrolled patients were randomly allocated to two groups with the aid of ClinStat software (http://www.sghms.ac.uk/depts/phs/staff/jmb/jm bsoft.htm). Of the 72 enrolled patients, 35 patients were allocated to the control gro-

Table 1. Baseline clinical characteristics of the patients

Characteristics	Control Group (n=35)	Experimental Group (n=37)	χ^2/t	*P* value
Age, years	45.6±14.8	46.8±13.5	1.678	0.095
Sex (male/female)	23/12	25/12	0.028	0.868
BMI, kg/m^2	23.8±4.1	24.2±3.2	0.012	0.990
Duration of psoriasis, years	11.5±5.9	12.7±8.4	0.253	0.801
Ethnicity (Han/Minority)	32/3	35/2	0.279	0.597
Religious (Yes/No)	25/10	29/8	0.463	0.496
Education level				
≤Middle school	11	12	0.302	0.860
High school	18	17		
≥College	6	8		
Economic status				
Poor	11	10	0.522	0.770
Fair	15	19		
Good	9	8		

Note: The data in baseline clinical characteristics of the patients between groups were compared with χ^2 test or T test. BMI, body mass index.

up receiving only acitretin treatment, other 37 cases were allocated to the experimental group receiving acitretin plus Chinese traditional medicine Qinzhu Liangxue Decoction. There were no significant differences in baseline demographic data between two groups. The control group was given the acitretin therapy at the daily dose of 30 mg for 8 weeks. The experimental group was received both acitretin and Qinzhu Liangxue Decoction. The Qinzhu Liangxue Decoction was provided from Yueyang Hospital of Integrated Traditional Chinese and Western Medicine, Shanghai University of Traditional Chinese Medicine, China. The Qinzhu Liangxue Decoction is composed of 30 g of magnetitum, 25 g of mother-of-pearl, 30 g of oyster, 9 g of scutellaria baicalensis, 9 g of lithospermum erythrorhizon, 9 g of cynanchum paniculatum, 10 g of raw coix lacryma-jobi, 9 g of Fang Feng and 6 g of raw glycyrrhiza uralensis fisch. The mixture is prepared by the pharmacy of the Yueyang Hospital of Integrated Traditional Chinese and Western Medicine. In brief, the mixture was fried 2 times for 30 min each time in 500 ml water and then mixed filter concentrated to 10 g/ml in liquid. The ethanol was continuously added to contain 70% ethanol in mixture. The containing 70% ethanol in mixture was retrieved by vacuum decompression after 24 h. The mixture was diluted by distilled water to 200 ml/flask for making 2.1 g crude drug in each ml. The patients were recommended to oral 30 ml per time and 2 times every day.

Therapeutical effect assessment

The treatment period lasted 8 weeks. Psoriasis area and severity index (PASI) was used to evaluate the therapeutical effect of the patients after treatment in comparison with baseline (week 0) as described previously. The patient's overall disease impact on quality of life was assessed with the Dermatology Life Quality Index (DLQI). A lower DLQI or PASI score represents a better outcome. In addition, a 9-point rating scale was employed to assess the degree of scaling, plaque elevation and erythema of target lesions (0=none, 1=mild, 2=moderate, 3=severe, and 4=very severe) as previous report, and then the scores of patients before and after treatment were calculated. An overall efficacy assessment was conducted posttreatment weeks 8 by using a defined 5-point grading scale: excellent improvement (>75%), marked improvement (51-75%), moderate improvement (26-50%), no improvement (0-25%) and deterioration [16].

Sampling and cytokine measurement

Five mL venous blood of patients with confirmed psoriasis vulgaris was collected before treatment, 4 and 8 weeks after treatment. The samples were extracted and centrifugated to obtain supematant, the obtained serum were preserved in refrigerator. The TNF-α, IL-8, IL-22, MIP-1α, MIP-1β and MCP-1 levels in each sample were measured by ELISA methods with the aid of Enzyme mark detector type Elx800 (BIO-TEK Co. USA).

Reagents

The commercial assay of ELISA kits for TNF-α and IL-8 were purchased from Boshi Biological Co Ltd (Wuhan, China). The ELISA kits for MIP-1α, MIP-1β, IL-22 and MCP-1 were purchased from R&D System (Minneapolis, MN, USA).

Statistical analysis

Data were expressed as mean ± SD or percentage. Statistical analysis was conducted by us-

Table 2. Mean PASI values for patients with psoriasis vulgaris in two groups

	n	Before treatment	4 weeks after treatment	8 weeks after treatment
Control Group	35	25.1±4.1	15.4±2.7*	7.8±2.1*
Experimental Group	37	24.9±3.8	10.5±2.3*,†	4.5±1.8*,†
t		0.188	10.039/11.238/3.152	8.154/7.269/2.238
P value		0.852	0.000/0.000/0.002	0.000/0.000/0.028

Note: All values are expressed as mean ± SD. *P<0.05 compared with that before treatment in each group; †P<0.05 compared to control group by covariance analysis at the same period. PASI, psoriasis area and severity index.

Table 3. Mean DLQI outcomes of psoriasis patients in two groups

	n	Before treatment	4 weeks after treatment	8 weeks after treatment
Control Group	35	11.8±3.2	8.5±1.9*	5.6±1.4*
Experimental Group	37	12.2±4.1	7.6±2.1*,†	2.3±0.9*,†
t		1.187	11.157/9.127/6.187	7.224/5.448/3.365
P value		0.073	0.000/0.000/0.000	0.000/0.000/0.001

Note: All values are expressed as mean ± SD. *P<0.05 compared with that before treatment in each group; †P<0.05 compared to control group by covariance analysis at the same period. DLQI, dermatology life quality index.

Table 4. An overall assessment of treatment efficacy in psoriasis patients (%)

Assessment of treatment	Control Group (n, %)	Experimental Group (n, %)	χ^2	*P* value
Excellent improvement	18 (51.4)	25 (67.6)*	4.580	0.032
Marked improvement	9 (25.7)	10 (27.0)		
Slight improvement	5 (14.3)	2 (5.4)		
No improvement	3 (8.6)	0 (0)		
Deterioration	0 (0)	0 (0)		

Note: **P* values are derived from chi-squares (the value was calculated post Fisher's exact correction).

ing SPSS 19.0 (SPSS Inc., Chicago, IL, USA). The scores for PASI and DLQI at the baseline and across two time points were compared by using Friedman's test. The post hoc comparisons between the baseline point and the other two points were compared using the Wilcoxon sign rank test. The comparison of various severity scores PASI and DLQI between two groups was tested with the Wilcoxon sign rank test. Pearson chi-square exact test was used to evaluate the overall assessment of treatment efficacy and adverse reactions. P<0.05 was considered as statistically significant.

Results

Of the 72 patients with psoriasis vulgaris, 35 cases were allocated to the control group and 37 cases were allocated to the experimental group. The baseline clinical data and demographics were similar to that of the two groups (**Table 1**). The mean PASI value for the control group of patients decreased from 25.1±4.1 before treatment to 15.4±2.7 or 7.8±2.1 after treatment for 4 weeks or 8 weeks, respectively. However, the mean PASI value reduced from 24.9±3.8 before treatment to 10.5±2.3 or 4.5±1.8 after treatment for 4 weeks or 8 weeks, respectively in the experimental group. Both of two groups of patients showed an obvious reduction in PASI value at 4 weeks or 8 weeks of treatment, but the PASI value in the experimental group had a better improvement than the control group within 8 weeks (**Table 2**). There was no significant difference between the DLQI values for the two groups before treatment. The DLQI score decreased from a median of 11.8 to 5.6 in the control group (n=35; P<0.05) and from 12.2 to 2.4 (n=37; P<0.05) in the experimental group during the course of 8 weeks. There was a significant difference in the decrease in DLQI score at the 8 weeks of treatment between the two groups, but not 4 weeks (**Table 3**). The treatment success rates (defined as at least marked improvement) assessed by the patients themselves were 77.1% in the control group and 94.6% in the experimental group, compared with the control group, the experimental

Table 5. Systematic inflammation for patients with psoriasis vulgaris in two groups

	TNF-α (pg/ml)	IL-8 (pg/ml)	IL-22 (pg/ml)	MIP-1α (pg/ml)	MIP-1β (pg/ml)	MCP-1 (pg/ml)
Control Group						
Before treatment	45.8±11.5	38.8±15.2	51.3±18.4	987.6±312.4	180.4±31.4	214.5±43.5
4 weeks after treatment	21.3±8.5*	24.3±13.1*	35.7±13.5*	782.8±298.1*	122.5±25.3*	177.8±35.1*
8 weeks after treatment	13.7±6.1*	15.3±7.4*	17.8±6.2*	543.4±214.4*	90.3±18.4*	155.7±22.6*
Experimental Group						
Before treatment	46.8±12.4	39.4±16.2	50.8±21.2	981.8±299.3	185.2±42.5	209.8±32.1
4 weeks after treatment	14.6±7.3*,†	17.4±8.5*,†	21.5±11.3*,†	521.4±214.2*,†	100.5±17.2*,†	145.2±21.8*,†
8 weeks after treatment	7.4±1.8*,†	8.5±2.3*,†	11.2±4.7*,†	213.5±167.9*,†	67.5±14.9*,†	110.8±16.9*,†

Note: All values are expressed as mean ± SD. *P<0.05 compared with that before treatment in each group; †P<0.05 compared to control group by covariance analysis at the same period. TNF-α, tumor necrosis factor-α; IL-8, interleukin-8; IL-22, interleukin-22; MIP-1α, macrophage inflammatory protein-1α; MIP-1β, macrophage inflammatory protein-1β; MCP-1, monocyte chemoattractant protein-1.

group exhibited statistically significant improvements in treatment efficacy elevation after 8 week of treatment (**Table 4**). Reductions in levels of TNF-α, IL-8, IL-22, MIP-α, MIP-β and MCP-1 were noted in both two groups at week 4 and week 8. The decreases in TNF-α, IL-8, IL-22, MIP-α, MIP-β and MCP-1 levels were significant between two groups during the same period. The TNF-α, IL-8, IL-22, MIP-α, MIP-β and MCP-1 levels in the experimental group were significantly lower than those of control group 4 weeks or 8 weeks after treatment (**Table 5**). No severe adverse events were observed during the treatment such as erythema and serious gastrointestinal events in two groups. 3 cases of dyslipidemia, 2 cases of dry lips, 4 case of pruritus, 3 cases of muscle pain were reported in the control group (12/35, 34.3%), 1 case of xerophthalmia, 1 case of dry skin and 1 case of slight headache were observed in the experimental group (3/37, 8.1%). All complaints all vanished after prescription of emollients, anti-analgesics and anti-pruritics.

Discussion

Psoriasis vulgaris is common relapsing inflammatory skin disease and hereditary disease, especially in middle and young patients, which is reflected by skin itching, burning, erythema scaling and secondary infection [17]. Although systemic therapies and phototherapy has been clinically used, the clinical effect is limited associated with the increased risk of infections and malignancies [18]. In the present study, to our knowledge, we provide the first evidence that combination of Qinzhu Liangxue Decoction with acitretin significantly improved the PASI and DLQI scores in monitoring plaque severity proposed by treatment guidelines in psoriasis vulgaris patients. The patients using both Qinzhu Liangxue Decoction and acitretin showed reductions of PASI and DLQI values those were significantly higher than those of patients using acitretin. The group treated with Qinzhu Liangxue Decoction and acitretin achieved best treatment efficacy than the control groups. The Qinzhu Liangxue Decoction combination ameliorated the adverse events of acitretin treatment of psoriasis vulgaris in the course of treatment. Interestingly, we observed that combined application of Qinzhu Liangxue Decoction and acitretin were able to significantly downregulate the concentrations of TNF-α, IL-8, IL-22, MIP-α, MIP-β and MCP-1 in the serum of patients with psoriasis. The negative regulation of TNF-α, IL-8, IL-22, MIP-1α, MIP-1β and MCP-1 may provide related mechanisms for potential antipsoriatic actions of Qinzhu Liangxue Decoction.

In western medicine, the corticosteroids and vitamin D analogues are recognized as the first-line therapies of psoriasis, the ultraviolet light therapy (UVB or UVA), classical systemic drugs including retinoids and cyclosporine are identified as the second-line therapies of psoriasis [18]. It is noted that the systemic biologics are used cautiously with regard to the safety profile for their long-term application. In addition, the costs of systemic biologics are relatively higher [19]. A recent survey indicates that 80% of individuals use natural products for their healthy in developing countries and one in three Americans also depend primarily on natural products daily [20]. The component Indian spice turmeric, curcumin has been clinically used for many years in traditional medicines of China and India [21], the curcumin with antioxidant

and anti-inflammatory activities has been applied to treat psoriasis in recent years [9], which paves the way to develop complementary and alternative medicine therapies of psoriasis. Indeed, the Chinese herbal medicine (CHM) has been well defined in the treatment of symptoms associated with psoriasis. The compounds of ingredients identified by Chinese herbal medicine expert have been demonstrated to have antipsoriatic actions via anti-inflammation and antiproliferation effects [22]. The CHM Sarcandra glabra (jiu jie cha) functions as effective agent for longstanding treatment for psoriasis [23]. The Qinzhu Liangxue Decoction used in the present study is consisted of magnetitum, mother-of-pearl, oyster, scutellaria baicalensis, lithospermum erythrorhizon, cynanchum paniculatum, coix lacryma-jobi, Fang Feng and raw glycyrrhiza uralensis fisch. The magnetitum is useful for therapy of tinnitus, deafness, headache, dizziness and kidney qi deficiency, palpitation, insomnia, and other symptoms of madness. The indications of mother-of-pearl are headache and dizziness, palpitation and insomnia; mania; epilepsy; liver heat and red eyes; veil covering the eyes [24]. The oyster is also called oyster yellow with therapeutic effects of sweat, spontaneous perspiration, spermatorrhea, diarrhea, uterine bleeding, vaginal discharge, surprised epilepsy, vertigo, scrofula nuclear sputum, hernia abdominal mass, heartache, carbuncle swollen and insomnia [25]. The scutellaria baicalensis is applied to release fire, neutralize poison, clear fever, stop bleeding and prevent miscarriage in forms of decoction and extracts, and it is demonstrated to exert anti-inflammation and antioxidant properties [26]. The lithospermum erythrorhizon is traditionally used to treat skin measles, skin cancer, hepatitis and chicken pox in China. A recent study indicates that lithospermum erythrorhizon may exhibit anti-inflammatory effects in lipopolysaccharide-stimulated BV2 microglial cells [27]. The isolated component of antofine from cynanchum paniculatum possesses antiviral, anti-pain, anti-inflammatory and antitumorigenic activities as an herbal remedy [28]. The traditional herb of coix lacryma-jobi is rich in amino acids, v itamins, protein, inorganic salts and carbohydrates and may be served as a anti-inflammatory an anticancer agents as well as a nutrient [29]. The traditional Chinese medicine of Fang Feng is widely cultivated in cool climate regions with Qufeng solution table, dampness and relieving pain, relieving convulsion effects. The ancient herb of glycyrrhiza uralensis fisch grows in arid, semi-arid desert steppe, desert margins and loess hilly region and has been widely used in the treatment of human diseases. Clinical and experimental studies have proved the indications of glycyrrhiza uralensis fisch for antioxidative, anti-inflammatory, antiallergic, anticancer, antispasmodic and hepatoprotective actions [30].

The PASI is the most commonly used to assess the severity of psoriasis at each visit in psoriasis clinical research [3]. The DLQI is a self-administered and dermatology-specific questionnaire that has been widely used for evaluation of dermatologic conditions [5]. In this study, both PASI and DLQI scores were observed and calculated to compare the clinical efficacy in two groups. Our results showed that both initial PASI and DLQI values were significantly decreased in two groups 4 and 8 weeks after treatment. There was a better improvement in PASI or DLQI score in the experimental group than those in the control group at 8 weeks. However, there was no significant difference in the DLQI improvement between two groups at 4 weeks. Furthermore, the treatment success rates in Qinzhu Liangxue Decoction plus acitretin group was significantly higher than the acitretin group. These results suggest that Qinzhu Liangxue Decoction significantly improved the appearance of psoriasis vulgaris and the life quality within 8 weeks.

Psoriasis is a chronic and recurrent inflammatory cell-regulated autoimmune disorder [1]. TNF-α is the most common cytokine that regulates the immune reaction and inflammation in endothelial cell and neutrophil. IL-8 is a chemokine produced by melanocyte to stimulate the proliferation of Keratinocyte [31]. It is evidenced that IL-8 is obviously elevated in peripheral blood of psoriasis patients and is positively associated with PASI score [32]. The serum levels of IL-8 and TNF-α are markedly increased in Egyptian psoriatic patients, the level of TNF-α is preferred to be more sensitive predictor for disease severity and the level of IL-8 is significantly correlated with the ages of patients [33]. It is recently reported that the levels of TNF-α, IL-8 were significantly decreased in psoriatic patients treated with CHM, Yinxieling decoction [34]. A recent finding demonstrates that IL-22 serum concentration was

significantly higher in Brazilian psoriasis patients [35]. System application of curcumin is indicated to be effective as an effective therapy for psoriasis linked with the decrease in serum IL-22 level [9]. The chemokines including MIP-1α, MIP-1β and MCP-1 are critical in autoimmune diseases and to be up-regulated in the peripheral blood of psoriasis patients [36]. Our results showed that the higher serum levels in TNF-α, IL-8, IL-22, MIP-1α, MIP-1β and MCP-1 were markedly decreased by Qinzhu Liangxue Decoction plus acitretin treatment. These results indicated that the increased serum levels of TNF-α, IL-8, IL-22, MIP-1α, MIP-1β and MCP-1 may be key mediators in the pathogenesis of psoriasis vulgaris. The protective mechanisms of Qinzhu Liangxue Decoction in psoriasis vulgaris may be closely correlated with the down-regulation of these inflammatory factors.

Taken together, combination of acitretin with Qinzhu Liangxue Decoction was proved to an adjuvant therapy for treatment of psoriasis vulgaris with fewer adverse reactions. It provided a safe and effective treatment strategy for psoriasis vulgaris and the ability to retard immunologic system-mediated inflammation may be pivotal mechanisms whereby the Qinzhu Liangxue Decoction had a therapeutic effect on the psoriasis vulgaris. In addition, multi-center, large-sample clinical trials are further confirmed to determine the long-term efficacy, safety and tolerability of Qinzhu Liangxue Decoction.

Disclosure of conflict of interest

None.

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References

[1] Cimmino MA. Epidemiology of psoriasis and psoriatic arthritis. Reumatismo 2007; 59 Suppl 1: 19-24.

[2] Gelfand JM, Weinstein R, Porter SB, Neimann AL, Berlin JA and Margolis DJ. Prevalence and treatment of psoriasis in the United Kingdom: a population-based study. Arch Dermatol 2005; 141: 1537-1541.

[3] Yan Y, Liu W, Andres P, Pernin C, Chantalat L, Briantais P, Lin A and Feng L. Exploratory clinical trial to evaluate the efficacy of a topical traditional chinese herbal medicine in psoriasis vulgaris. Evid Based Complement Alternat Med 2015; 2015: 719641.

[4] Menter A, Gottlieb A, Feldman SR, Van Voorhees AS, Leonardi CL, Gordon KB, Lebwohl M, Koo JY, Elmets CA, Korman NJ, Beutner KR and Bhushan R. Guidelines of care for the management of psoriasis and psoriatic arthritis: Section 1. Overview of psoriasis and guidelines of care for the treatment of psoriasis with biologics. J Am Acad Dermatol 2008; 58: 826-850.

[5] Gelfand JM, Feldman SR, Stern RS, Thomas J, Rolstad T and Margolis DJ. Determinants of quality of life in patients with psoriasis: a study from the US population. J Am Acad Dermatol 2004; 51: 704-708.

[6] Stawczyk-Macieja M, Szczerkowska-Dobosz A, Rebala K and Purzycka-Bohdan D. Genetic background of skin barrier dysfunction in the pathogenesis of psoriasis vulgaris. Postepy Dermatol Alergol 2015; 32: 123-126.

[7] Wolf R, Orion E, Ruocco E and Ruocco V. Abnormal epidermal barrier in the pathogenesis of psoriasis. Clin Dermatol 2012; 30: 323-328.

[8] Newman DJ and Cragg GM. Natural products as sources of new drugs over the last 25 years. J Nat Prod 2007; 70: 461-477.

[9] Antiga E, Bonciolini V, Volpi W, Del Bianco E and Caproni M. Oral Curcumin (Meriva) Is Effective as an Adjuvant Treatment and Is Able to Reduce IL-22 Serum Levels in Patients with Psoriasis Vulgaris. Biomed Res Int 2015; 2015: 283634.

[10] Mukherjee PK and Wahile A. Integrated approaches towards drug development from Ayurveda and other Indian system of medicines. J Ethnopharmacol 2006; 103: 25-35.

[11] Saurat JH. Retinoids and psoriasis: novel issues in retinoid pharmacology and implications for psoriasis treatment. J Am Acad Dermatol 1999; 41: S2-6.

[12] Yang L, Zhang CS, May B, Yu J, Guo X, Zhang AL, Xue CC and Lu C. Efficacy of combining oral Chinese herbal medicine and NB-UVB in treating psoriasis vulgaris: a systematic review and meta-analysis. Chin Med 2015; 10: 27.

[13] Teng L, Shaw D and Barnes J. Characteristics and practices of Traditional Chinese Medicine retail shops in London, UK: A cross-sectional study using an observational approach. J Ethnopharmacol 2015; 173: 318-329.

[14] May BH, Zhang AL, Zhou W, Lu CJ, Deng S and Xue CC. Oral herbal medicines for psoriasis: a review of clinical studies. Chin J Integr Med 2012; 18: 172-178.

[15] Li FL, Li B, Xu R, Song X, Yu Y and Xu ZC. [Qinzhu Liangxue Decoction in treatment of blood-heat type psoriasis vulgaris: a randomized controlled trial]. Zhong Xi Yi Jie He Xue Bao 2008; 6: 586-590.

[16] Tzung TY, Wu JC, Hsu NJ, Chen YH and Ger LP. Comparison of tazarotene 0.1% gel plus petrolatum once daily versus calcipotriol 0.005% ointment twice daily in the treatment of plaque psoriasis. Acta Derm Venereol 2005; 85: 236-239.

[17] Pai SB and Shetty S. Guidelines for bath PUVA, bathing suit PUVA and soak PUVA. Indian J Dermatol Venereol Leprol 2015; 81: 559-567.

[18] Nast A, Boehncke WH, Mrowietz U, Ockenfels HM, Philipp S, Reich K, Rosenbach T, Sammain A, Schlaeger M, Sebastian M, Sterry W, Streit V, Augustin M, Erdmann R, Klaus J, Koza J, Muller S, Orzechowski HD, Rosumeck S, Schmid-Ott G, Weberschock T and Rzany B. S3-Guidelines on the treatment of psoriasis vulgaris (English version). Update. J Dtsch Dermatol Ges 2012; 10 Suppl 2: S1-95.

[19] Javitz HS, Ward MM, Farber E, Nail L and Vallow SG. The direct cost of care for psoriasis and psoriatic arthritis in the United States. J Am Acad Dermatol 2002; 46: 850-860.

[20] Fleischer AB Jr, Feldman SR, Rapp SR, Reboussin DM, Exum ML and Clark AR. Alternative therapies commonly used within a population of patients with psoriasis. Cutis 1996; 58: 216-220.

[21] Ammon HP and Wahl MA. Pharmacology of Curcuma longa. Planta Med 1991; 57: 1-7.

[22] Koo YK, Kim JM, Koo JY, Kang SS, Bae K, Kim YS, Chung JH and Yun-Choi HS. Platelet anti-aggregatory and blood anti-coagulant effects of compounds isolated from Paeonia lactiflora and Paeonia suffruticosa. Pharmazie 2010; 65: 624-628.

[23] Onderdijk AJ, Balak DM, Baerveldt EM, Florencia EF, Kant M, Laman JD, van IJcken WF, Racz E, de Ridder D, Thio HB and Prens EP. Regulated genes in psoriatic skin during treatment with fumaric acid esters. Br J Dermatol 2014; 171: 732-741.

[24] Zhao Y, Xiao Y and Xie Y. [Correlation between change of immunotoxicology indexes of cerum and the occurrence of anaphylaxis in patients induced by qingkailing injection: a clinical study]. Zhongguo Zhong Yao Za Zhi 2011; 36: 2579-2583.

[25] Han SY, Lee JR, Kwon YK, Jo MJ, Park SJ, Kim SC, Lee HS and Ku SK. Ostreae Testa prevent ovariectomy-induced bone loss in mice by osteoblast activations. J Ethnopharmacol 2007; 114: 400-405.

[26] Peng Y, Guo CS, Li PX, Fu ZZ, Gao LM, Di Y, Ju YK, Tian R and Xue JJ. Immune and anti-oxidant functions of ethanol extracts of Scutellaria baicalensis Georgi in mice bearing U14 cervical cancers. Asian Pac J Cancer Prev 2014; 15: 4129-4133.

[27] Prasad RG, Choi YH and Kim GY. Shikonin Isolated from Lithospermum erythrorhizon Down-regulates Proinflammatory Mediators in Lipopolysaccharide-Stimulated BV2 Microglial Cells by Suppressing Crosstalk between Reactive Oxygen Species and NF-kappaB. Biomol Ther (Seoul) 2015; 23: 110-118.

[28] Jang EJ, Kim HK, Jeong H, Lee YS, Jeong MG, Bae SJ, Kim S, Lee SK and Hwang ES. Anti-adipogenic activity of the naturally occurring phenanthroindolizidine alkaloid antofine via direct suppression of PPARgamma expression. Chem Biodivers 2014; 11: 962-969.

[29] Wang L, Gao S, Jiang W, Luo C, Xu M, Bohlin L, Rosendahl M and Huang W. Antioxidative dietary compounds modulate gene expression associated with apoptosis, DNA repair, inhibition of cell proliferation and migration. Int J Mol Sci 2014; 15: 16226-16245.

[30] Zhang J, Gao W, Yan S and Zhao Y. Effects of Space Flight on the Chemical Constituents and Anti-Inflammatory Activity of Licorice (Glycyrrhiza uralensis Fisch). Iran J Pharm Res 2012; 11: 601-609.

[31] Coimbra S, Oliveira H, Reis F, Belo L, Rocha S, Quintanilha A, Figueiredo A, Teixeira F, Castro E, Rocha-Pereira P and Santos-Silva A. Interleukin (IL)-22, IL-17, IL-23, IL-8, vascular endothelial growth factor and tumour necrosis factor-alpha levels in patients with psoriasis before, during and after psoralen-ultraviolet A and narrowband ultraviolet B therapy. Br J Dermatol 2010; 163: 1282-1290.

[32] Arican O, Aral M, Sasmaz S and Ciragil P. Serum levels of TNF-alpha, IFN-gamma, IL-6, IL-8, IL-12, IL-17, and IL-18 in patients with active psoriasis and correlation with disease severity. Mediators Inflamm 2005; 2005: 273-279.

[33] Abdel-Hamid MF, Aly DG, Saad NE, Emam HM and Ayoub DF. Serum levels of interleukin-8, tumor necrosis factor-alpha and gamma-interferon in Egyptian psoriatic patients and correlation with disease severity. J Dermatol 2011; 38: 442-446.

[34] Dai YJ, Li YY, Zeng HM, Liang XA, Xie ZJ, Zheng ZA, Pan QH and Xing YX. Effect of Yinxieling decoction on PASI, TNF-alpha and IL-8 in patients with psoriasis vulgaris. Asian Pac J Trop Med 2014; 7: 668-670.

[35] de Oliveira PS, Cardoso PR, Lima EV, Pereira MC, Duarte AL, Pitta Ida R, Rego MJ and Pitta MG. IL-17A, IL-22, IL-6, and IL-21 Serum Levels in Plaque-Type Psoriasis in Brazilian Patients. Mediators Inflamm 2015; 2015: 819149.

[36] Dai YJ, Li YY, Zeng HM, Liang XA, Xie ZJ, Zheng ZA, Pan QH and Xing YX. Effect of pharmacological intervention on MIP-1alpha, MIP-1beta and MCP-1 expression in patients with psoriasis vulgaris. Asian Pac J Trop Med 2014; 7: 582-584.