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Clinical Efficacy of Acupoint acupuncture Combined with Moxibustion Treatment on Allergic Rhinitis and Its Impact onInflammatory Factors Levels and Life Quality of Patients

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Keywords

Allergic Rhinitis, Acupoint acupuncture, Moxibustion

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Abstract

Background To analyze the clinical efficacy of acupoint acupuncture combined with moxibustion treatment on allergic rhinitis and its impact oninflammatory factors levels and life quality of patients. **Methods:** A total of 70 patients with allergic rhinitis who were treated in our hospital from Jan. 2017 and Dec. 2018 were selected as subjects, and they were divided into observation group (n=35) and control group (n=35) according to the random number table method. The observation group received acupoint acupuncture combined moxibustion treatment, the control group received conventional drug treatment. The clinical efficacy, symptom and sign scores, inflammatory factors levels (tumor necrosis factor (TNF)- α , interleukin (IL)-4 and IL-5) and life quality (rhinoconjunctivitis quality of life (RQLQ) scores) were compared between the two groups. **Results:** The total effective rate of observation group was significantly higher than that in control group ($P < 0.05$); After treatment, the symptom and sign scores were both significantly lower than those before treatment ($P < 0.05$), and the symptom and sign scores in observation group were lower than those in control group ($P < 0.05$); After treatment, the levels of TNF-α, IL-4 and IL-5 in the two groups were significantly decreased as compared with before treatment($P < 0.05$), and the levels of TNF-α, IL-4 and IL-5 in observation group were obviously lower than those in control group ($P < 0.05$); After treatment, the RQLQ scores in the two groups were significantly decreased as compared with before treatment ($P < 0.05$), and the RQLQ scores in observation group were obviously lower than those in control group ($P < 0.05$).**Conclusion:** Acupoint acupuncture combined with moxibustion treatment had a good

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clinical efficacy on allergic rhinitis, alleviating the symptom, sign and inflammatory response, and improving the life quality in patients.

1 Introduction

Allergic rhinitis is an IgE-mediated inflammatory reaction in nasal mucosa after body exposure to an allergen and is typically characterized by paroxysmal sneezing, clear nasal discharge, nasal itching and nasal obstruction [1], usually accompanied by allergic conjunctivitis, rhinosinusitis, epistaxis and other symptoms. Currently, there are no effective radical means to cure allergic rhinitis, bringing about heavy economic burden as well as mental stress to patients and seriously impacting upon their quality of life [2]. Acupoint acupuncture and moxibustion are common treatment approaches for allergic rhinitis with good clinical efficacy in tradition Chinese medical science [3-4]. Nevertheless, studies about treating allergic rhinitis through acupoint acupuncture combined with moxibustion treatment are few, lacking comprehensive evaluation of patients' symptoms, signs, inflammation level and quality of life. Thus, the present work analyzed the clinical effect of acupoint acupuncture combined with moxibustion treatment on allergic rhinitis and its influence on relevant symptoms, signs, inflammatory factor levels and life quality of patients, hoping to provide helpful information for its clinical application.

2 Materials and methods

2.1 Clinical data

Research object

A total of 70 cases with allergic rhinitis treated in our hospital from January 2017 to December 2018 were selected according to the inclusion criteria and divided into observation group (n=35) and control group (n=35) using random number table. The clinicopathological variables of each case containing sex, age and course of disease were collected from patient records. Observation group: gender, 16 males and 19 females; age, 25-38 years; average age, 31.5 ± 4.2 years; course of disease, 5-9 years, 6.73±1.24 years; average course of disease, 7.3±1.1 years. Control group: gender, 18 males and 17 females; age, 27-36 years; average age, 30.9±4.4 years; course of disease, 6-9 years; average course of disease, 7.5±0.9 years. No significant difference among gender, age and course of disease was viewed between the two groups ($P > 0.05$). The work was approved by the Ethics Committee of our Hospital with all patients volunteering to participate in the experiments with the informed consent acquired.

Inclusion and exclusion criteria

Inclusion criteria were: 1. patients meeting the diagnostic criteria of moderate-severe persistent allergic rhinitis [5]; 2. course of disease ≥ 1 year. Exclusion criteria were: 1. patients getting respiratory tract infection and acute rhinosinusitis within two weeks; 2. inflammatory reactions performed through chest X-ray films; 3. a moderately severe deviation or rhinopolypus occurring in the nasal septum; 4. patients with paroxysmal respiratory disease; 5. steroid, antihistamines, antibiotics or decongestants taken within a week; acupoint acupuncture treatment received within two weeks; immunotherapy or regular hormone therapy received within the past one year; 6. patients with hepatic and pulmonary dysfunction or smoking more than 10 cigarettes one day for over 10 years; 7. abnormality observed during the coagulation test; 8. patients in pregnancy and lactation or pregnancy planned in the near future; 9. patients with mental disorder.

2.2 Method

Control group

Patients were given conventional drug treatment including Loratadine Tablets provided by Chengdu Hengrui Pharmaceutical Co., Ltd. (10 mg for once, once a day; H20030112) and Budesonide Aerosol provided by Lunan Better Pharmaceutical Co., Ltd. (200 μg for once, twice a day; H20030987) for 28 d.

Observation group

Patients in the observation group received acupoint acupuncture combined with moxibustion treatment: points of Yingxiang, Bitong (Shangyingxiang), Yintang, Fengchi (pair), Hegu (pair), Lieque (pair) and Zusanli (pair) were treated with acupoint

acupuncture while double Feishu, double Pishu and double Shenshu were treated with moxibustion. After skin disinfection, oblique needling on Yingxiang penetrated to Bitong (an obvious acid bilge feeling of nasal cavity and root of nose as well as unobstructed nostrils meant a proper needling). A needle was horizontally inserted into Yintang using skin-pinching up needle inserting with the needle tip pointing to the nose tip (an obvious acid bilge feeling of nose meant a proper needling). A needle was acupunctured about 30mm at the tip of the nose (Fengchi; needling sensation spreading to the root of nose or the forehead meant a proper needling). Hegu and Lieque were acupunctured through upward oblique insertion of needles and Zusanli points of both sides were acupunctured using reinforcing-reducing method by twirling needle. The needle was manipulated once at those acupoints above successively with an interval of 10 min as well as 30-minute needle retention for each acupoin and acupuncture therapy was employed once every other day, as 7 times of acupuncture therapy was a course of treatment. In the meanwhile, the mild moxibustion therapy was adopted through using pure moxa stick approximately 2 cm above the skin of double Feishu, double Pishu and double Shenshu points for 10 min/point until the local skin was ruddy, with moxibustion operated once every other day and 7 times was a course of treatment. The clinical efficacy was evaluated after two courses of treatment (28 d).

Clinical efficacy evaluation

The clinical efficacy was evaluated by calculating the condition improvement rate on a basis of the statistics on symptom and sign scores before and after treatment. The criteria were as follows: marked effectiveness, improvement rate ≥ 70%; effectiveness, 21% ≤ improvement rate ≤ 69%; without effectiveness, improvement rate ≤ 20%. Total effective rate = (the number of marked effectiveness and effectiveness cases/the number of total cases) × 100%.

2.3 Outcome measures

Clinical symptoms [6]

Clinical symptom score was assessed from 4 aspects composed of sneezing, running nose, nasal obstruction and nasal itching: no symptom=0; slight symptom=1; moderate symptom=2; relative severe=3; very severe=4. The full marks of each item were 4 points with the total score 16 points. The higher score a patient got, the more severe his/her symptoms were.

Relevant signs [7]

Six indexes comprising edema of nasal mucosa, nasal secretion, abnormality in middle nasal meatus, deviation of nasal septum, nasal polyp and pinkeye were viewed to determine the sign score. The full marks of each item were 3 points with the total score 18 points. The higher score a patient got, the more severe his/her signs were.

Serum inflammatory factors

The morning fasting peripheral blood (5 mL for each) of patients before and after treatment was taken to test levels of serum inflammatory factors. Tumor necrosis factor (TNF)-α, Interleukin (IL)-4 and IL-5 were detected by enzyme linked immunosorbent assay (ELISA) according to the instructions.

Quality of life

Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) was distributed to patients before and after treatment and the contents consisted of 7 dimensions, as the score of each dimension ranged from 0 to 6 points. The higher score a patient got, the worse his/her quality of life was. The life quality of all patients was evaluated by the same senior physician.

2.4 Statistical analysis

SPSS 19.0 (IBM, Armonk, NY, USA) was utilized for statistical analysis, with the enumeration data were analyzed by the χ^2 test whereas the measurement data were compared by Student's *t* test and presented as the means ± standard deviation. $P < 0.05$ suggested a statistically significant difference.

3 Results

3.1 Clinical efficacy

As shown in table 1, the total effective rate of observation group was 91.43% while that of control group was 68.57%. The total effective rate of observation group was significantly higher than control group ($P < 0.05$).

Table 1 Clinical efficacy between two groups

Group	Case	Marked effectiveness	effectiveness	Without effectiveness	Total effective rate
Observation	35	19（54.29）	13（37.14）	3（8.57）	32（91.43）
Control	35	12（34.29）	12（34.29）	11（31.43）	24（68.57）
χ^2					5.714
P					0.017

3.2 Symptom and sign scores

There was no prominent difference of symptom and sign scores between observation and control groups before treatment (Table 2, $P > 0.05$) whereas the scores of symptoms and signs in two groups both dramatically decreased after treatment (Table 2, $P < 0.05$). In addition, the symptom and sign scores in observation group appreciably reduced when contrasted with control group (Table 2, $P < 0.05$).

3.3 Inflammatory factor level

It did not differ notably among serum TNF-α, IL-4 and IL-5 levels between two groups before treatment (Table 3, $P > 0.05$) while the levels of TNF-α, IL-4 and IL-5 in two groups after treatment were significantly lower than those before treatment (Table 3, $P < 0.05$), as the patients in observation group obviously reduced the TNF-α, IL-4 and IL-5 levels in contrast with control group (Table 3, $P < 0.05$).

RQLQ score

No prominent difference of RQLQ scores between two groups was observed before treatment (Table 4, $P > 0.05$). And both groups dramatically declined the RQLQ scores after treatment in comparison with their respective groups before treatment (Table 4, $P < 0.05$). Besides, the RQLQ score of observation group notably lower than control group (Table 4, $P < 0.05$).

Table 2 Symptom and sign scores between two groups

Group	Case	Symptom（point）		Sign（point）	
		before	after	before	after
Observation	35	11.12±1.66	5.72±0.75[a]	10.44±1.43	4.62±0.65[a]
Control	35	10.85±1.58	7.69±0.92[a]	10.37±1.51	6.11±0.91[a]
t		0.697	-9.819	0.199	-7.882
P		0.488	0.000	0.843	0.000

Note: compared with before treatment，[a]$P < 0.05$.

Table 3 Inflammatory factor level between two groups

Group	Case	TNF-α（μg/L）		IL-4（ng/L）		IL-5（ng/L）	
		before	After	Before	After	Before	After
Observation	35	4.15±0.76	1.67±0.31[a]	28.45±3.12	21.44±2.89[a]	109.66±11.42	92.45±8.75[a]
Control	35	4.08±0.83	2.24±0.52[a]	27.66±3.27	25.73±3.07[a]	112.35±10.74	102.36±9.27[a]
t		0.368	-5.570	1.034	-6.020	-1.015	-4.599
P		0.714	0.000	0.305	0.000	0.314	0.000

Note: compared with before treatment，[a]$P < 0.05$.

Table 4 RQLQ score between two groups

Group	Case	Before	After	*t*	*P*
Observation	35	28.62±9.75	14.62±3.15	8.083	0.000
Control	35	27.54±9.36	19.36±5.26	4.507	0.000
t		0.473	-4.574		
P		0.638	0.000		

4 Discussion

Allergic rhinitis is a chronic respiratory tract disease induced by interaction of gene and environment. The theory of traditional Chinese medicine thinks that the nose closely relates to climate, meridian, zang-fu (viscera), pathogenic qi and physique. Allergic rhinitis belongs to a category of "Biqiu", the external cause of which mostly is invasion of pathogenic wind-cold and wind-heat evils to nostrils and the internal cause is dysfunction of zang-fu (viscera) (qi deficiency of lung, spleen and kidney) [8]. Both acupoint acupuncture and moxibustion can regulate the functions of zang-fu (viscera) and defend against invasion of pathogenic wind-cold and wind-heat evils to nostrils so as to effectively treat allergic rhinitis, which are conventional therapies for allergic rhinitis in traditional Chinese medicine [9]. However, the treatment of acupoint acupuncture combined with moxibustion on allergic rhinitis is less reported. Our study found that acupoint acupuncture combined with moxibustion effectively treated allergic rhinitis, ameliorated symptoms and signs of patients, inhibited inflammatory response and promoted patients' quality of life.

Located in sides of alae nasi, Yingxiang is the crossing point of Yangming Large Intestine Meridian of Hand and Yangming Stomach Meridian of Foot; full of veniplex, Bitong is located in the middle of the hollow under the nasal bone and the upper end of nasolabial sulcus with one point in each side; Yintang is in the superior edge of the nasion where the governor vessel passes through. Those three points are all effective points for treating nasal obstruction, as the acupoint acupuncture at them is able to mitigate the clinical symptoms (nasal obstruction etc.) of allergic rhinitis. Cui et al. [10] discovered that electroacupuncture at Yingxiang enabled the effective rate of allergic rhinitis treatment to be 93.3% and the research of Wang Liming [11] exhibited that the acupuncture at Bitong maintained longer therapeutic efficiency when compared with Mometasone Furoate Aqueous Nasal Spray. Additionally, it was reported that the application of warming needle moxibustion in combination with ginger moxibustion to allergic rhinitis treatment resulted in an effective rate up to 96.8% [12]. Agreeing with the previous studies, our work revealed that the efficacy of acupoint acupuncture combined with moxibustion treatment on allergic rhinitis was significantly better than conventional drug treatment and effectively alleviated relevant symptoms and signs, which could effectively treat allergic rhinitis.

Furthermore, the etiological analysis of traditional Chinese medicine theory thinks that the invasion of pathogenic wind-cold and wind-heat is the symptom while the dysfunction of zang-fu (viscera) and deficiency of vital qi is the root cause. Acupuncture at Fengchi plays a vital role in expelling pathogenic wind; Hegu and Lieque are key points for treatment of head and face diseases, realizing an effect on dispelling wind pathogens, diaphoresis relieving superficies, dispersing lung qi and unblocking stuffy orifice; the function of moxibustion on warming yang for dispelling cold is capable of expelling deficiency-cold of spleen, kidney and lung. Thereby, it was supposed that the acupuncture at above points in combination with moxibustion could dispel wind pathogens, relieve superficies by diaphoresis, expel deficiency-cold and synthetically modulate function of zang-fu (viscera) to treat allergic rhinitis from origin. According to study of Ranran Ding etc. [13] , the acupuncture at Lieque speeded up the restoration of rat nasal mucosa epithelial cells and decreased inflammatory cells (eosinophilic granulocyte etc.) so as to improve allergic symptoms. Liu et al. [14] presented that moxibustion at specific acupoints based

on different types of visceral-qi deficiency-cold in allergic rhinitis, combining with Biyankang Tablets or Ditong Rhinitis Water, notably raised the therapeutic effectiveness for allergic rhinitis. Taken above together, we considered that for one thing, acupoint acupuncture combined with moxibustion ameliorated clinical symptoms like nasal obstruction through local acupuncture, for another, that method achieved a better treatment effect by the synthetic regulation of zang-fu (viscera) function.

TNF-α participates in the immunopathological process of patients with allergic rhinitis, which provides a reference for diagnosis and treatment of allergic rhinitis [15]. IL-4 and IL-5 secreted by Th2 cells are both involved in the procedures of generation and differentiation of B cells and promote the production of IgE, leading to inflammatory reaction [16]. Our experiments observed that acupoint acupuncture combined with moxibustion appreciably declined the serum TNF-α, IL-4 and IL-5 levels of allergic rhinitis patients. The study of Niu et al. showed that acupuncture at Zusanli could mediate human immune system [17]. And based on the previous research, Zhan et al. [18] proposed that moxibustion played a critical part in affecting a variety of immune organs, immune cells and immunoregulatory factors and further improved immune function of the body entirely. Modern medicine widely believed that the imbalance of immune response of Th1/Th2 cells as well as regulatory T-cell (Treg) and Th17 cells is the major cause of nasal mucosa inflammation and allergic rhinitis [19]. Those findings implicated that acupoint acupuncture combined with moxibustion might regulate immune system of patients to reduce inflammatory response level and facilitate the recovery of allergic rhinitis. What's more, we also discovered that acupoint acupuncture combined with moxibustion effectively enhanced life quality of allergic rhinitis patients.

In a word, acupoint acupuncture combined with moxibustion treatment has a good clinical efficacy on allergic rhinitis, not only alleviating relevant symptoms and signs, but also suppressing inflammatory reaction and ameliorating the life quality in patients, which has an important clinical application value.

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Conflict of Interest

The authors declare no conflicts of interest.

Author contributions

Conceptualization, C.F.H and X.Y.C; Data curation,C.F.H; Formal analysis, X.Y.C; Methodology, C.F.H; Writing-Original draft, X.Y.C and C.F.H; Writing-review and editing, X.Y.C and C.F.H; All authors have read and agreed to the published version of the manuscript.

Ethics Approval and Consent to Participate

The study was approved by the Medical Ethics Committee, and the patients were informed and consented.

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Availability of Data and Materials

The data presented in this study are available on request from the corresponding author.

Supplementary Material

Not applicable

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