Applied Research of Chinese Herbal Fire Therapy in Stable Stage COPD Patients with Lung-Spleen Qi Deficiency Pattern

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Abstract

Objective This study aims to evaluate the efficacy of traditional Chinese medicine fire therapy in patients with stable chronic obstructive pulmonary disease (COPD) of the lung-spleen qi deficiency type. Methods Sixty patients with stable COPD of the lung-spleen qi deficiency type who met the inclusion criteria were selected and randomly divided into a control group (30 cases) and a traditional Chinese medicine fire therapy group (30 cases) using a randomized controlled trial design. The control group received conventional treatment and nursing care, while the traditional Chinese medicine fire therapy group received additional traditional Chinese medicine fire therapy based on the control group's treatment, administered once every 2 days for a total of 5 sessions as one treatment course. The treatment duration for both groups was 14 days. Traditional Chinese medicine symptom scores and pulmonary function were assessed in patients before treatment initiation and after treatment completion. Results The traditional Chinese medicine fire therapy group exhibited significantly lower traditional Chinese medicine symptom scores compared to the control group ($P<0.001$), and pulmonary function indicators including FEV1, FVC, and the FEV1/FVC ratio also showed significant improvement ($P<0.05$). The control group demonstrated no significant improvement in traditional Chinese medicine symptoms or pulmonary function after treatment ($P>0.05$). Conclusion Traditional Chinese medicine fire therapy demonstrates significant clinical efficacy in patients with stable COPD of the lung-spleen qi deficiency type, effectively improving patients' traditional Chinese medicine symptoms and pulmonary function indicators. Traditional Chinese medicine fire therapy possesses certain clinical application value and may serve as an adjunctive therapy for COPD treatment.

Full Text

Application of Traditional Chinese Medicine Fire Therapy in Stable COPD Patients with Lung-Spleen Qi Deficiency Pattern

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Abstract

Objective: This study aimed to evaluate the efficacy of traditional Chinese medicine (TCM) fire therapy in stable chronic obstructive pulmonary disease (COPD) patients with lung-spleen qi deficiency pattern.

Methods: Sixty COPD patients in stable phase with lung-spleen qi deficiency were selected and randomly divided into a control group (n=30) and a TCM fire therapy group (n=30) using a randomized controlled trial design. The control group received conventional treatment and nursing care, while the TCM fire therapy group received additional TCM fire therapy every two days for five sessions per treatment course. Both groups were treated for 14 days. TCM symptom scores and pulmonary function were assessed before and after treatment.

Results: The TCM fire therapy group showed significantly lower TCM symptom scores compared to the control group ($P<0.001$). Pulmonary function indicators including FEV1, FVC, and FEV1/FVC ratio also improved significantly ($P<0.05$). The control group showed no significant improvement in TCM symptoms or pulmonary function after treatment ($P>0.05$).

Conclusion: TCM fire therapy demonstrates significant clinical efficacy in stable COPD patients with lung-spleen qi deficiency pattern, effectively improving both TCM symptomatology and pulmonary function indicators. TCM fire therapy holds clinical application value and may serve as an adjunctive therapy for COPD treatment.

Keywords: Traditional Chinese medicine fire therapy; Chronic obstructive pulmonary disease (COPD); Stable stage; Lung-spleen qi deficiency pattern; TCM symptom score; Pulmonary function indicators

Introduction

Chronic obstructive pulmonary disease (COPD) is a serious chronic respiratory disease characterized by progressive airflow limitation and chronic respiratory inflammation [1-3]. The etiology of COPD is complex, involving factors such as smoking, environmental pollution, and genetics [3-4]. Lung-spleen qi deficiency represents a specific TCM pattern in COPD, primarily manifesting as fatigue,

shortness of breath, lassitude, poor appetite, and other deficiency symptoms [5-7].

Current COPD treatments both domestically and internationally focus on pharmacotherapy, oxygen therapy, mechanical ventilation, and pulmonary rehabilitation. Although existing treatments such as medication, oxygen therapy, and rehabilitation can alleviate symptoms to some extent, their long-term efficacy is suboptimal with numerous side effects, and they have limitations in improving patient symptoms and lung function [8-14]. Therefore, identifying safer and more effective therapeutic approaches represents a current research priority.

TCM fire therapy is a novel moxibustion technique that integrates TCM theory with modern technology. It utilizes heat generated from alcohol combustion to deliver herbal medicine deep into the skin, stimulating acupoints and affected areas, dredging meridians, regulating yin-yang balance, and supporting vital qi to dispel pathogenic factors, thereby effectively alleviating various symptoms [15-16]. This study investigates the application of TCM fire therapy in stable COPD patients with lung-spleen qi deficiency pattern, providing scientific evidence for its broader clinical implementation.

Methods

Study Design and Participants

This study enrolled 60 stable COPD patients with lung-spleen qi deficiency pattern who were treated at our hospital's respiratory outpatient clinic between June 2022 and June 2023.

Diagnostic Criteria: Western medicine diagnosis followed the "Guidelines for the Diagnosis and Treatment of Chronic Obstructive Pulmonary Disease (2021 Revised Edition)" issued by the Chinese Thoracic Society [1], defining stable COPD as patients with stable or improved symptoms (dyspnea, cough, and sputum production) who had recovered to their pre-exacerbation state. TCM diagnosis followed the "TCM Diagnosis and Treatment Guidelines for Chronic Obstructive Pulmonary Disease (2011 Edition)" [17]. The lung-spleen qi deficiency pattern included: (1) cough or wheezing with shortness of breath worsened by activity; (2) fatigue, lassitude, or spontaneous sweating aggravated by exertion; (3) susceptibility to colds and aversion to wind; (4) poor appetite and food stagnation; (5) epigastric or abdominal distension with loose stools; (6) enlarged tongue body with teeth marks, thin white or greasy coating, and deep-thin or deep-slow or thin-weak pulse [18].

Inclusion Criteria: Patients presenting with two items from criteria (1)(2)(3) above plus two items from criteria (4)(5)(6); good mental status with normal communication ability and ability to lie supine; voluntary participation with signed informed consent; and complete medical records.

Exclusion Criteria: Allergic constitution or herbal allergy; severe disease in other organs; confirmed malignant tumors; infectious or psychiatric diseases;

other lung lesions; mental disorders or treatment non-compliance; diabetes with reduced local skin heat sensitivity; hypertension with blood pressure exceeding 170/110 mmHg; and pregnant or lactating women.

Dropout Criteria: Poor compliance with treatment protocol; voluntary withdrawal; severe side effects or adverse reactions; pregnancy or development of other diseases requiring treatment during the study period.

Using a random number table method, 30 patients were assigned to the control group and 30 to the TCM fire therapy group. The control group comprised 20 males and 10 females, aged 53-74 years with a mean age of $(55.26\$\pm6.23)years.TheTCMfiretherapygroupcomprised22malesand8females, aged54-72yearswithameanageof(56.63\pm\$4.92)$ years. No statistically significant differences were observed between groups in baseline characteristics including age and gender (P>0.05). All participants provided informed consent.

Treatment Protocols

Control Group The control group received salmeterol/fluticasone propionate inhalation powder (Glaxo Wellcome Production, Import Drug Registration No. H20150324) at a dose of 50 g/250 g, once daily for 14 days. Nursing care included: instruction on proper inhaler technique, guidance on home oxygen therapy methods and precautions, and dietary recommendations for strengthening spleen and lung (consuming porridge made from rice, coix seed, lotus seeds, Chinese yam, and codonopsis). TCM symptom scores and pulmonary function were assessed before and after the 14-day treatment period.

TCM Fire Therapy Group Treatment Team: A specialized TCM fire therapy team was established, consisting of one senior nurse and ten experienced nurses. The senior nurse received comprehensive TCM fire therapy training and was responsible for training and guiding other team members. All members possessed extensive clinical experience and proficient operational skills to ensure safety and accuracy. Three physicians were responsible for case collection, observation, and data analysis, while nurses conducted patient assessments, treatment implementation, efficacy evaluation, and data compilation.

Treatment Protocol: The TCM fire therapy group received conventional treatment plus TCM fire therapy. The herbal formula consisted of: Aconite 10g, Cinnamon Twig 30g, Codonopsis 50g, Dried Ginger 50g, Atractylodes 50g, and Honey-fried Licorice 15g. These herbs were ground into powder and stored in sealed bottles. Each fire therapy session lasted 30 minutes, administered every two days, with five sessions constituting one treatment course (total 14 days). TCM symptom scores and pulmonary function were assessed before and after treatment.

Procedure: (1) Pre-treatment assessment for contraindications; (2) Herbal cake preparation: Mix TCM fire therapy powder with hot water to form a

paste, select appropriate fireproof ring, cover with cloth sleeve, place in treatment tray, spread paste on cloth to create a cake 0.2-0.3 cm thick; (3) Application: Patient lies supine with abdomen exposed. When cake temperature reaches 39-41°C, apply to abdomen with thermometer between cake and skin. Shape fireproof ring according to patient body type to maximize skin contact; (4) Pre-ignition: Cover cake with plastic wrap and double-layered wet towel, mark ignition area, and drip alcohol in S-pattern (30ml initially); (5) Treatment: Ignite alcohol at marked edge. As alcohol burns, abdominal skin temperature gradually rises. Monitor patient comfort and thermometer (maximum 49°C). When patient feels mild heat, extinguish with warm wet towel. When temperature drops and patient feels cooling, re-ignite for heating. Continue for 30 minutes while monitoring for adverse reactions. Nurses must remain in treatment room; (6) Post-treatment: Clean local skin, observe skin condition (mild redness and warmth are normal), assist with dressing, advise 30-minute rest, increased water intake, avoid cold/raw foods, avoid wind-cold exposure, and no bathing for two hours.

Outcome Measures

TCM Symptom Assessment: TCM syndrome scores were evaluated by attending physicians at baseline and day 14. Efficacy was determined using criteria from the "Guiding Principles for Clinical Research of New Chinese Medicines" [18] by comparing pre- and post-treatment scores. Cough, sputum, and dyspnea were graded as mild (1 point), moderate (2 points), or severe (3 points). Clinical control required $ $70% improvement in symptom scores with reduced exacerbations; markedly effective required 50-70% improvement; effective required 30-50% improvement; and ineffective was <30% improvement.

Pulmonary Function Assessment: Using an Italian COSMED pulmonary function test system (Model: QUARK PFT3), the same technician performed three measurements after ensuring patient calmness, selecting the best result. Primary indicators were FEV1, FEV1%, and FEV1/FVC%, with higher values indicating better lung function.

Statistical Analysis: Data were analyzed using SPSS 22.0 software. Categorical and ordinal data were analyzed using chi-square and Mann-Whitney U tests respectively. Measurement data were expressed as mean±standard deviation (x±s) and compared between groups using independent samples t-test. $P<0.05$ was considered statistically significant.

Results

TCM Symptom Scores

No significant difference in TCM symptom scores existed between groups at baseline ($P>0.05$). After treatment, both groups showed significant within-group improvements ($P<0.05$), with the TCM fire therapy group demonstrating significantly lower scores than the control group ($P<0.05$). See Table 1 .

Table 1: Comparison of TCM Symptom Scores Between Groups (x±s) | Group | n | Pre-treatment | Post-treatment | Within-group t | Within-group p | |——-|—|————|————-|————-|————-| | TCM Fire Therapy | 30 | 9.76$±2.99|2.33±1.15| — | — ||*Control*|30|9.56±2.82|4.70±$2.28 | - | - | | Between-group t | - | - | - | - | - | | Between-group p | - | - | - | - | <0.05 |

Pulmonary Function Tests

FEV1: No significant baseline difference existed between groups (P>0.05). After treatment, both groups showed significant improvement compared to baseline (P<0.05), with the TCM fire therapy group demonstrating superior improvement (P<0.05). See Table 2 .

Table 2: Comparison of FEV1 Between Groups (x±s) | Group | n | Pre-treatment | Post-treatment | Within-group t | Within-group p | |——-|—|————|————-|————-|————-| | TCM Fire Therapy | 30 | 1.58$±0.21|2.17±0.27|—|—||*Control*|30|1.54±0.26|2.03±$0.24 | - | - | | Between-group t | - | - | - | - | - | | Between-group p | - | - | - | - | <0.05 |

FVC: No significant baseline difference existed between groups (P>0.05). After treatment, both groups showed significant improvement compared to baseline (P<0.05), with the TCM fire therapy group demonstrating superior improvement (P<0.05). See Table 3 .

Table 3: Comparison of FVC Between Groups (x±s) | Group | n | Pre-treatment | Post-treatment | Within-group t | Within-group p | |——-|—|————|————-|————-|————-| | TCM Fire Therapy | 30 | 1.58$±0.21|2.17±0.27|—|—||*Control*|30|1.54±0.26|2.03±$0.24 | - | - | | Between-group t | - | - | - | - | - | | Between-group p | - | - | - | - | <0.05 |

FEV1/FVC Ratio: No significant baseline difference existed between groups (P>0.05). After treatment, both groups showed significant improvement compared to baseline (P<0.05), with the TCM fire therapy group demonstrating superior improvement (P<0.05). See Table 4 .

Table 4: Comparison of FEV1/FVC Ratio Between Groups (x±s) | Group | n | Pre-treatment | Post-treatment | Within-group t | Within-group p | |——-|—|————|————-|————-|————-| | TCM Fire Therapy | 30 | 52.39$±6.64|61.19±7.04| — | — ||*Control*|30|52.60±6.65|56.64±$6.63 | - | - | | Between-group t | - | - | - | - | - | | Between-group p | - | - | - | - | <0.05 |

Discussion

This study demonstrates that TCM fire therapy yields significant therapeutic effects in stable COPD patients with lung-spleen qi deficiency pattern. Regarding TCM symptom scores, no baseline differences existed between groups, but post-treatment scores were markedly lower in the TCM fire therapy group, indicating positive effects on symptom improvement. Pulmonary function tests

further confirmed superior improvements in the TCM fire therapy group, substantiating its advantages in COPD treatment.

The therapeutic mechanism of TCM fire therapy may involve synergistic thermal and herbal effects. Thermal effects promote blood circulation, relieve muscle spasms, and dilate pores, helping alleviate COPD symptoms [11,19]. The herbal components, predominantly warming in nature, possess yang-warming and cold-dispersing properties that specifically address lung-spleen qi deficiency patterns [20-21].

Stable phase management is critical for preventing acute exacerbations and delaying disease progression. For lung-spleen qi deficiency patients, TCM fire therapy offers advantages as a non-pharmacological intervention with simple operation and reliable safety, making it a viable adjunctive therapy for stable COPD. However, this study focused exclusively on stable COPD patients with lung-spleen qi deficiency; efficacy in other patterns or disease stages requires further investigation. Additionally, deeper mechanistic research and technical refinement are needed to enhance clinical efficacy and facilitate broader application.

In summary, TCM fire therapy shows promising results as an adjunctive treatment for stable COPD patients with lung-spleen qi deficiency pattern. Future research should further explore its mechanisms and indications to provide additional therapeutic options for COPD management.

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