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The Application Effect of Auricular Point Application Combined with Acupoint Application Nursing in Patients with Chronic Obstructive Pulmonary Disease Accompanied by Cough

Jiang Yuan*
Nanjing Traditional Chinese Medicine Hospital, Nanjing 210000, Jiangsu, China

**Author to whom correspondence should be addressed.*

Abstract: *Objective:* To explore the clinical effect of auricular point application combined with acupoint application nursing on patients with chronic obstructive pulmonary disease (COPD) accompanied by cough. *Methods:* 100 patients admitted to our hospital from January 2023 to January 2024 were randomly divided into a control group (conventional nursing) and an observation group (conventional nursing + auricular point application combined with acupoint application), with 50 patients in each group. The cough symptoms, pulmonary function, inflammatory factors, and traditional Chinese medicine (TCM) syndrome scores were compared between the two groups after nursing. *Results:* The observation group had lower cough scores and duration than the control group; FEV1 and FEV1/FVC were higher than those in the control group; IL-6 and TNF-α levels were lower; TCM syndrome total score and sub-item scores were significantly reduced ($p < 0.05$). *Conclusion:* This nursing program can improve symptoms, enhance pulmonary function, and reduce inflammation, and is worthy of promotion.

Keywords: Chronic obstructive pulmonary disease; Cough; Auricular point application; Acupoint application; Nursing effect

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1. Introduction

Chronic obstructive pulmonary disease (COPD) is a common clinical chronic respiratory disease characterized by persistent airflow limitation. Cough accompanies the entire course of the disease, seriously affecting patients' quality of life, exacerbating airway damage, and increasing the risk of acute exacerbation [1]. Although current clinical routine care can relieve symptoms, targeted intervention for cough is insufficient. Traditional Chinese medicine nursing technology has significant advantages in the management of chronic respiratory diseases [2,3]. Auricular acupoint pasting regulates the Qi and blood of the organs and relieves cough by stimulating acupoints on the ear. Acupoint pasting relies on the transdermal penetration of drugs and stimulation of acupoints to resolve phlegm and relieve cough. This study uses auricular point

sticking combined with acupoint sticking for patients with COPD and cough, aiming to explore better nursing strategies.

2. Materials and methods

2.1. General information

The research sample selected 100 patients with COPD and cough who were admitted to the Department of Respiratory Medicine of our hospital from January 2023 to January 2024. They were divided into control group and observation group using random number table method, with 50 research subjects included in each group. In the control group, there were 28 males and 22 females; their age ranged from 45 to 75 years old, with an average of (60.2 ± 5.8) years; the duration of COPD was 3 to 12 years, with an average of (7.1 ± 2.3) years; the cough duration ranged from 1 to 4 weeks, with an average of (2.2 ± 0.6) weeks. In the observation group, there were 26 males and 24 females; the age range was 46 to 74 years old, with an average of (61.0 ± 5.5) years; the duration of COPD was 3 to 13 years, with an average of (7.3 ± 2.1) years; the duration of cough was 1 to 4 weeks, with an average of (2.3 ± 0.5) weeks. There were no significant differences in baseline characteristics such as gender, age, COPD disease duration, and cough duration between the two groups of patients ($p > 0.05$), and the research subjects had good homogeneity.

2.1.1. Inclusion criteria

(1) Refer to the diagnostic criteria for COPD in the "Guidelines for the Diagnosis and Treatment of Chronic Obstructive Pulmonary Disease (2021 Revised Edition)", and be accompanied by more frequent persistent cough symptoms (≥ 3 attacks per day and lasting for ≥ 1 week);
(2) Aged between 45 and 75 years old;
(3) The patient is in a good state of consciousness and has the ability to cooperate in completing nursing operations and indicator assessments;
(4) Patients and their families voluntarily signed an informed consent form after fully understanding the research content.

2.1.2. Exclusion criteria

(1) The presence of other respiratory diseases such as bronchial asthma, tuberculosis, lung cancer;
(2) Suffering from severe heart, liver, kidney and other organ dysfunction;
(3) The ear skin or the skin at the application site is damaged, infected, allergic, etc. and is not suitable for application;
(4) Are pregnant or breastfeeding;
(5) Have used antitussive drugs or corticosteroids in the past week

2.2. Method

Both groups of patients received 2 weeks of basic treatment for COPD, including bronchodilators and anti-infective drugs when necessary.

2.2.1. Control group: Routine care

(1) Respiratory tract
Guide effective phlegm elimination, turn over and pat the back 2-3 times a day, atomize if necessary
(2) Oxygen therapy
Low flow oxygen (1–2 L/min) and monitor blood oxygen
(3) Health
Promote smoking cessation, avoidance of irritants, and guidance on daily routine
(4) Medication

Remind you to take medication on time and explain the efficacy and risks of the medication

2.2.2. Observation group: Routine care + external treatment with traditional Chinese medicine

(1) Auricular acupoint pressing

Take 5 national standard acupoints such as the lungs and trachea, disinfect them with ethanol and apply Auricularia vulgaris seeds, press on one ear for 3–5 minutes/time, 3–4 times/day, alternate between ears, and change twice a week

(2) Acupoint application

Make a paste of four traditional Chinese medicines in a ratio of 3:1:2:1 and apply it to 3 groups of acupoints including Feishu for 4-6 hours (remove if discomfort occurs), twice a week

2.3. Observation indicators

(1) Cough symptoms

After 2 weeks of care, use the "Cough Symptom Rating Scale" (0 to 3 points) to evaluate the severity, record the daily cough duration and take the average.

(2) Pulmonary function

After 2 weeks of nursing, use a spirometer to detect FEV1 and FEV1/FVC.

(3) Inflammatory factors

5 mL of fasting venous blood was collected before and after nursing, and IL-6 and TNF-α levels were measured by enzyme-linked immunoassay.

(4) Traditional Chinese Medicine syndrome

According to the "Standards for Diagnostic and Efficacy of Traditional Chinese Medicine Diseases", 4 symptoms such as cough and sputum are scored from 0 to 3 points, and the total score is calculated after 2 weeks of care.

2.4. Statistical analysis

The data processing link was completed using SPSS26.0 software. Among them, measurement data are presented in the form of ($\bar{x} \pm s$), differences between groups are analyzed by independent samples *t*-test, and differences within groups are explored by paired *t*-test; count data are described by rate (%), and χ^2 test is used for comparison between groups. In the study, $p < 0.05$ was used as the criterion for judging the statistical significance of differences between groups.

3. Results

3.1. Comparison of cough symptom indicators between the two groups of patients

After 2 weeks of nursing intervention, the cough score of the observation group was lower than that of the control group, and the cough duration was relatively shorter. The difference between the groups showed certain significance in the statistical test ($p < 0.05$). See **Table 1** for specific results.

Table 1. Comparison of cough symptom indicators between the two groups of patients after care ($\bar{x} \pm s$)

Group	n	Cough score (points)	Cough duration (min/d)
Control group	50	1.82 ± 0.45	25.68 ± 6.32
Observation group	50	0.95 ± 0.32	14.25 ± 4.18
t value	-	8.963	7.542
p value	-	< 0.001	< 0.001

3.2. Comparison of pulmonary function indicators between the two groups of patients

After 2 weeks of nursing, the FEV1 and FEV1/FVC indicators of the observation group were relatively better than those of the control group. After statistical analysis, the difference between the groups was statistically significant ($p < 0.05$). The specific results are shown in **Table 2**.

Table 2. Comparison of pulmonary function indicators between the two groups of patients after care ($\bar{x} \pm s$)

Group	n	FEV1 (L)	FEV1/FVC (%)
Control group	50	1.68±0.31	56.32±4.85
Observation group	50	2.05±0.35	62.15±5.12
t value	-	6.235	5.987
p value	-	<0.001	<0.001

3.3. Comparison of inflammatory factor levels between the two groups of patients

Before the implementation of the nursing intervention, the IL-6 and TNF-α index detection values of the two groups of research subjects were statistically analyzed and showed no significant difference ($p > 0.05$); after 2 weeks of continuous nursing, the IL-6 and TNF-α levels of both groups declined to a certain extent, and the observation group showed a more obvious improvement trend than the control group, and the data difference between the groups was statistically significant ($p < 0.05$). See **Table 3** for specific results.

Table 3. Comparison of inflammatory factor levels between the two groups of patients before and after care ($\bar{x} \pm s$, pg/mL)

Indicator	Group	n	Before care	After care	*t* value within group	Within-group *p* value	*t* value between groups
IL-6	Control group	50	18.65 ± 3.21	14.23 ± 2.56	7.892	< 0.001	6.754
	Observation group	50	18.72 ± 3.18	9.85 ± 2.13	12.365	< 0.001	-
TNF-α	Control group	50	25.36 ± 4.15	20.18 ± 3.24	6.983	< 0.001	8.217
	Observation group	50	25.41 ± 4.09	14.52 ± 2.87	13.542	< 0.001	-

3.4. Comparison of TCM syndrome scores between the two groups of patients

After 2 weeks of nursing, the observation group was better than the control group in sub-scores and total scores of symptoms such as cough, sputum, asthma, chest tightness, etc., and the difference between the groups showed statistical significance ($p < 0.05$). See **Table 4** for specific results.

Table 4. Comparison of TCM syndrome scores between the two groups of patients after care ($\bar{x} \pm s$, points)

Group	n	Cough	Expectoration	Asthma	Chest tightness	Total score
Control group	50	1.52 ± 0.38	1.45 ± 0.35	1.38 ± 0.32	1.26 ± 0.29	5.61 ± 1.05
Observation group	50	0.78 ± 0.25	0.72 ± 0.23	0.65 ± 0.21	0.58 ± 0.18	2.73 ± 0.68
t value	-	11.236	12.568	13.124	14.875	15.982
p value	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

4. Discussion

Chronic obstructive pulmonary disease with cough is a common chronic respiratory disease in clinical practice. The disease course is prolonged and recurring, which not only damages the patient's physiological functions but also seriously affects the quality of life. From the perspective of modern medicine, the core pathological change is chronic inflammation of the airway, lung parenchyma and pulmonary blood vessels: inflammation continues to stimulate the submucosal cough receptors in the airway, causing increased airway mucus secretion and decreased mucociliary clearance, leading to sputum retention and aggravating cough; long-term inflammation also triggers airway remodeling, exacerbating airflow limitation and decreased pulmonary ventilation function, and the decline in lung function reacts on the respiratory center, forming a vicious cycle of "inflammation-cough-function decline" [4,5]. Although routine care can relieve some symptoms through respiratory tract cleaning, oxygen therapy, etc., it lacks targeted intervention on the root causes of inflammation and regulation of cough reflexes, and has limited effect on improving cough and lung function.

Traditional Chinese medicine classifies COPD with cough into the categories of "lung bloating", "cough" and "wheezing syndrome", and uses a holistic view and syndrome differentiation thinking to understand its pathogenesis: the lung governs breathing, and is responsible for the release and decline of Qi. Exogenous pathogenic factors, internal injuries, long-term illness or long-term smoking will damage the lung's Qi, causing the lung's function to dissipate and decline. Abnormality, loss of fluid distribution and accumulation of phlegm, turbid phlegm blocking the lungs, and poor Qi movement will lead to coughing and asthma; long-term disease will also involve the spleen and kidneys, the spleen will not move well, and phlegm and dampness will develop, and the kidneys will not accept Qi, and asthma will worsen, ultimately forming the core pathogenesis of "deficiency of the lungs, spleen, and kidneys, and phlegm blocking the collaterals." Therefore, TCM nursing care needs to focus on the goals of "tonifying the lungs and replenishing Qi, resolving phlegm and relieving cough, regulating Qi and relieving asthma", and restore the function of the organs and the movement of Qi and blood through multiple channels.

Auricular acupoint sticking is an important component of external treatment in traditional Chinese medicine. It is based on the theory of "the ear is the gathering point of the main meridians", the twelve meridians of the human body are directly or indirectly connected to the ears. Specific acupoints on the ears are the projections of Qi and blood of the organs and meridians. Stimulating auricular acupoints can regulate the functions of the organs [6,7]. The auricular acupoint combination selected in this study has clear effects: the lung acupoints and trachea acupoints directly correspond to the disease location, and can regulate the lungs' release and release, relieve airway spasm, and reduce coughs; the Shenmen acupoint can calm and soothe the mind, relieve patients' anxiety caused by long-term coughing, and regulate the central nervous system. system, inhibit the over-excited cough reflex arc, and reduce airway hyperresponsiveness; the adrenal gland acupoints and subcortical acupoints can regulate the body's immunity, anti-inflammation and anti-allergy, reduce chronic inflammation of the airway by affecting hormone levels and immune cell activity, and reduce cough triggers from the root [8]. In terms of operation, pressing the ear acupoints multiple times a day can continuously provide gentle stimulation, allowing signals to be transmitted to the central nervous system and organs through meridians, forming long-term regulation. Moreover, this method is easy to operate, non-invasive and painless, and has high patient compliance.

Acupoint application is a typical application of the theory of "external treatment and internal effect" and "acupoint administration" of traditional Chinese medicine. The therapeutic effect depends on the synergy of drug action and acupoint stimulation. The drug compatibility and acupoint selection in this study were demonstrated through syndrome differentiation: in terms of drugs, white mustard seed warms the lungs and resolves phlegm, promotes Qi and dissipates stagnation, and is an important medicine for cold phlegm blocking the lungs; Gansui is bitter and cold, expels water and eliminates phlegm, clears phlegm in the lungs; Corydalis Corydalis is warm and unblocking, promotes Qi and blood circulation, relieves pain and asthma, and improves poor lung Qi movement; Asarum is pungent and warm, warms the lungs and resolves fluids, clears the orifices and relieves pain, and enhances drug penetration and meridian conduction. The four medicines are used together with cold and warm to attack and nourish, which is consistent with the pathogenesis of "phlegm blocking the lungs"; as an excipient, ginger juice not only enhances the adhesion of the medicine, but its warm

nature can also promote the opening of skin pores and accelerate the transdermal absorption of the medicine. In terms of acupuncture point selection, Feishu acupoint is the back Shu acupoint of the lung, which is the acupoint on the back where lung Qi is injected. It can directly regulate and replenish lung Qi, relieve cough and asthma, and is the core acupoint for lung diseases; Tanzhong acupoint is "Qi meets Tanzhong". It can regulate Qi, widen the chest, harmonize Qi movement, and improve chest tightness and asthma caused by poor lung Qi. Dingchuan point is an extra-meridian point, which is a special point for relieving cough and asthma. It is located close to Feishu, which can enhance its effect of relieving cough and asthma. After transdermal absorption of the drug, on the one hand, a local concentration gradient is formed, which directly acts on the meridians and tissues around the acupuncture points, exerting anti-inflammatory and alleviating airway spasm effects; on the other hand, through conduction through the meridians, the drug effect is delivered to the lungs and related organs, achieving overall conditioning and improving the function of the lungs and the circulation of Qi and blood throughout the body.

From the perspective of synergy, auricular acupoint sticking focuses on regulating the functions of the central nervous system and viscera through meridian conduction, and improves cough reflex and inflammatory state from the "regulatory end"; acupoint sticking focuses on clearing phlegm and dredging lung collaterals from the "local end" through drug penetration and acupoint stimulation. The two are one internal and one external, one regulating and one treating, forming a coordinated intervention system of "central regulation–local anti-inflammation–functional recovery", which can not only relieve cough symptoms in a targeted manner, but also improve pulmonary ventilation function, reduce airway inflammation, regulate TCM syndromes, and achieve multi-dimensional improvement of "symptoms-function-syndrome". This synergistic effect is the core reason why the various indicators of the observation group are better than those of the control group, and also reflects the advantages of "holistic conditioning, syndrome differentiation and care" of traditional Chinese medicine nursing.

From the perspective of clinical application value, auricular point pressing and acupoint taping are both non-invasive nursing technologies. The operation does not require special equipment, is low-cost, and has few adverse reactions. Only a few patients may experience slight local skin itching, which can be relieved by adjusting the application time. The patient acceptance and compliance are high, and it is suitable for promotion by medical institutions at all levels, especially primary hospitals. However, this study has limitations: the sample size is limited to a single center, and there may be selection bias; the observation time is short, and the long-term impact of the nursing program on the frequency of acute exacerbations of COPD was not evaluated; and there was no stratified analysis of the differences in efficacy among patients with different syndrome types. Future research can expand the sample size, conduct multi-center, long-term follow-up studies, and explore more individualized nursing plans based on TCM syndrome differentiation, so as to provide more sufficient evidence support for the application of TCM nursing in patients with COPD and cough.

About the author

Jiang Yuan (1988.08-) female; Han nationality; native of Chizhou, Anhui; undergraduate degree; supervisor nurse; research direction: clinical nursing of traditional Chinese medicine.

Disclosure statement

The author declares no conflict of interest.

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