

CLINICAL STUDY

Effect of traditional Chinese and western medicine combined with lung rehabilitation training on pulmonary function in patients with chronic obstructive pulmonary disease complicated with chronic cor pulmonale and evaluation of efficacy

Jing ZHANG, Bei JIANG

Nursing Department, Hainan Cancer Hospital, Haikou, China. jiangbei220613@163.com

ABSTRACT

OBJECTIVES: To investigate the effect and efficacy of traditional Chinese and western medicine combined with lung rehabilitation training on pulmonary function in patients with chronic obstructive pulmonary disease (COPD) complicated with chronic cor pulmonale.

METHODS: Totally 200 COPD patients with chronic cor pulmonale in our hospital were selected as research objects. The 100 patients in control group were managed by conventional western medicine combined with lung rehabilitation training, and another 100 patients in observation group were treated with traditional Chinese and western medicine combined with lung rehabilitation training. The pulmonary function (modified British Medical Research Council (mMRC) Dyspnea Scale, COPD Assessment Tests (CAT), BODE index (body-mass, airflow obstruction, dyspnea, and exercise capacity), pulmonary function-related indexes (FEV₁, FVC, FEV₁/FVC, and FEV₁/Pred), and blood gas analysis indicators (paO₂, PaCO₂, SaO₂ and PH value)) and curative effect (the effectiveness, Satisfaction Test, Quality of Life Score, and TCM Syndrome Integral) before and after treatment within or between groups were compared.

RESULTS: Before treatment, the pulmonary function and curative effect (Quality of Life Score and TCM Syndrome Integral) parameters showed no significant difference between the two groups, which indicated there was a comparability between the two groups. After treatment, all parameters of pulmonary function and curative effect displayed better results in observation group than in control group. Compared with the results before treatment, pulmonary function and curative effect revealed better in both groups after treatment, and more visible improvement trends were found in observation group.

CONCLUSIONS: Traditional Chinese and western medicine combined with lung rehabilitation training displayed better results on lung function and curative effect than conventional western medicine combined with lung rehabilitation training in patients with COPD complicated with chronic cor pulmonale (*Tab. 8, Ref. 43*). Text in PDF www.elis.sk

KEY WORDS: traditional Chinese and western medicine combined, lung rehabilitation training, chronic obstructive pulmonary disease, pulmonary function, curative effect.

Introduction

Chronic obstructive pulmonary disease (COPD) is a common chronic disease and respiratory disease in clinic, which is characterized by expiratory airflow limitation (1). Generally, this airflow obstruction of the respiratory tract in COPD sufferers is progressive and irreversible, gives rise to impaired lung function over time, manifests as a series of respiratory symptoms, including dyspnea, cough, sense of suppression in the chest, and sputum production (2), and chronic cor pulmonale usually occurs when it develops into late stage (3). Currently, COPD is deemed as one of

the most leading causes of morbidity and mortality in the world, and it will become the fifth factor of disability and the third factor of mortality worldwide based on the data of WHO in 2020 (4–6). It deprives more than 3 million people's life all over the world every year, seriously affects the quality of life of patients, and brings a huge healthcare and economic burden to the whole world (7). Besides, as a vital cause of disability, the emergence of chronic cor pulmonale (a short for chronic pulmonary heart disease) has increased the death rate from COPD in recent years (8). Therefore, it is urgent to improve lung function, correct potential complications such as chronic cor pulmonale, and improve the quality of life for COPD patients.

For the treatments, it mainly includes removing incentives (such as stop smoking for COPD in smokers), drug treatments aiming at the symptoms, getting vaccines (such as flu vaccine and pneumonia vaccine), oxygen therapies, health education, nutri-

Nursing Department, Hainan Cancer Hospital, Haikou, China

Address for correspondence: Bei JIANG, Nursing Department, Hainan Cancer Hospital, Haikou, No. 8, Changbin West Fourth Street, Xiuying District, Haikou City 570100, Hainan Province, China.

tional support, pulmonary rehabilitation programs (such as respiratory muscle exercise), social support, even surgical procedures (such as lung volume reduction surgery or lung transplantation) (9). Despite advances of conventional treatments of western medicine such as cardiotoxic or anti-infectious drugs (statins and azithromycin) (10, 11), inhalations of glucocorticoid (corticosteroids), long acting beta 2 (β^2) receptor agonists, or long acting muscarinic antagonists, etc. (12, 13) according to the patient's condition in the treatment of symptoms and prevention of acute exacerbations of COPD (7), few progresses have been made to improve lung function or quality of life. Meanwhile, lung rehabilitation training is a major method to ameliorate lung function and quality of life of COPD patients especially in stable stage, it has been applied in COPD treatment and achieved good results during recent years (14, 15). In recent years, traditional Chinese medicine has the characteristics of small adverse reactions, and the efficacy of traditional Chinese medicine in the treatment of COPD has been gradually recognized, especially in the prevention and treatment during its stable period (16, 17). Traditional Chinese medicine believes lung (Fei)-kidney (Shen) qi deficiency is one of the most important pathogenetic factors in stable COPD (18, 19). Tonifying kidney therapy for COPD comprising tonifying kidney (Shen) only, tonifying kidney (Shen) and lung (Fei), tonifying kidney (Shen) and spleen (pi), and tonifying lung (Fei), spleen (pi) and kidney (Shen) (17). In addition, for the treatment of stable COPD in clinical practice in China, tonifying kidney (Bushen) therapy which includes multiple compounds to tonifying kidney, lung or spleen, is usually widely used in unity with other traditional Chinese medicine therapies and/or conventional western medicine remedies (17). However, there are few studies on the effects of traditional Chinese and Western medicine combined with pulmonary rehabilitation training on lung function, and their curative effect in COPD patients. So, in this work, we will investigate the roles of traditional Chinese (self-made Tonifying Lung and Kidney decoction) and Western medicine combined with pulmonary rehabilitation training on pulmonary function in patients with COPD complicated with chronic cor pulmonale as well as their efficacies.

Materials and methods

Subjects investigated and groups

A total of 200 patients diagnosed as COPD complicated with chronic cor pulmonale during stationary phase in the department of respiratory medicine of our hospital from Dec 2015 to Dec 2019 were randomly divided into control and observation groups, each group included 100 patients. The general data of gender, age, and course of disease were compared between the two groups. This study was approved by our hospital, all patients were informed of the study and signed an informed letter. The research program was approved by the ethics committee of our hospital, and the informed consent of the family was signed and obtained before any medical dispositions.

The diagnostic criteria were based on the “Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Lung Disease 2017 Report: GOLD Executive Summary” (20)

and “Pathogenesis and diagnosis of chronic cor pulmonale” (21).

Inclusion criteria were: (1) Normal liver and kidney functions, and no other organ diseases; (2) Normal cognitive function and no mental illnesses; (3) No blood-related diseases; (4) No cancer or other life-threatening diseases; (5) No complications other than chronic cor pulmonale; (6) Case data were anholonomic.

Exclusion criteria included: (1) Liver and kidney dysfunction, and diagnosed with major organ diseases; (2) Patients with blurred consciousness, cognitive impairment and mental disorders; (3) Patients with blood-related diseases; (4) Complicated with cancer or other life-threatening diseases; (5) Complicated with chronic heart failure, and cardiovascular and cerebrovascular diseases; (6) Case data were holonomic.

Therapeutic method

The patients in control group received conventional Western medicine combined with lung rehabilitation training. The conventional Western medicine treatments included comprehensive treatment of nutritional support, dispelling phlegm, relieving spasm and relieving asthma, anti-infection and anti-inflammation, low-flow oxygen inhalation, maintaining water and electrolyte balances and acid-base balance, strengthening heart, etc., appropriate inhalation of glucocorticoid or long-acting β^2 receptor agonists, etc., according to the patient's condition. The Indian physic lung rehabilitation training was conducted and described as previous reported studies (15, 22), which included respiratory training (consisting of abdominal breathing training and inspiration training aids training (VOLDYNE5000 respiratory training aids) and lower extremity endurance training (consisting of NUSTEP exercise and climbing stairs training).

In observation group, based on the control group, the traditional Chinese medicine decoction was added. Based on the previous reports about the traditional Chinese medicine Tonifying Lung or Kidney therapy applying to COPD (17, 23), we used a self-made Tonifying Lung and Kidney decoction, and the ingredients were as follows: Gypsum 30 g, Angelica sinensis 20 g, The root of red-rooted salvia 20 g, Houptuynia cordata 15 g, Codonopsis pilosula 15 g, Astragalus mongholicus 15 g, Fructus Psoraleae 15 g, Ephdra vulgaris 10 g, Apricot kernel 10 g, Platycodon grandiflorum 10g, Fritillaria thunbergii Miq. 10 g, Arisaema cum bile 10 g, Radix Ophiopogonis 10 g, Lily 10 g, Morinda officinalis 10 g, FRUCTUS CORNI 10 g, Schisandra chinensis 10 g, Poria cocos 10 g, The root bark of white mulberry 10 g, Pericarpium citri reticulatae 6 g, Grilled licorice 4 g. The taking method was: taking water decoction, 1 dose per day, taking in the morning and evening, continuous treatment for 10 days.

Lung function assessments

The modified British Medical Research Council Dyspnea Scale (mMRC) (24), COPD Assessment Tests (CAT) (25), arterial blood gas analysis (including oxygen partial pressure (paO_2), carbon dioxide partial pressure (paCO_2), oxygen saturation (SaO_2), demic pH value) (26, 27), and other pulmonary function-related indexes (including forced expiratory volume in 1 s (FEV1)(L), forced vital capacity (FVC)(L), 1 second forced expiratory volume

to forced vital capacity ratio (FEV1/FVC(%)), 1 second forced expiratory volume to predicted value ratio (FEV1/Pred(%)) (26, 28) were used for evaluation of pulmonary functions before and after treatment. Among them, the mMRC score was divided into 1 to 4 grades, the higher the grade, the higher the severity of dyspnea. The CAT score was evaluated from 8 problems including cough, energy, sleep, etc.. Each option was scored in the range of 0–5 according to the patient’s own condition. Furthermore, the BODE (body-mass, airflow obstruction, dyspnea, and exercise capacity) index was calculated based on the results of mMRC and CAT, and the higher the score of BODE index, the higher the severity of COPD.

Evaluation of efficacy

Evaluation of efficacy covered 4 aspects of Effectiveness, Satisfaction Test, Quality of Life Score and TCM Syndrome Integral. Effectiveness evaluation was performed after treatment, and included obvious validity (signs and clinical symptoms of patients basically disappeared or disappeared), effectiveness (the patient’s signs and clinical symptoms were effectively improved), invalidity (the patient’s signs and clinical symptoms were not improved or even aggravated), and total effective rate (the sum of obvious validity and effectiveness). Satisfaction Test was conducted after treatment, and included satisfaction, general, unsatisfied and total satisfaction rate. According to the internal Cai Yingyun’s COPD quality of life scale in 1997, the quality of life of patients before and after treatment was evaluated. The scale contains a total of 35 items, including daily life ability, social activities, depressive psychological disorders, and anxiety psychological disorders, and the higher the quality of life, the higher the score. TCM Syndrome Integral of patients was assessed before and after treatment. TCM Syndromes mainly include cough, expectoration, wheezing, and chest tightness, each item scores 5 points, and the higher the score, the more serious the symptoms of patients.

Statistical analysis

SPSS22.0 software was used for statistical analysis, the results were expressed as means ± standard deviation (SD), number (n) and rate (%). For enumeration/count data (gender), the χ^2 test was performed between the two groups, and for the data of rate (%), χ^2 test was carried out. For measurement data, paired t test was used for comparing intragroup statistical differences, and independent-samples t-test and student’s t-test were carried out between two groups. Moreover, For the rank count data (effectiveness evaluation, satisfaction test), Rank sum test was used. $p < 0.05$ was regarded as statistical significance.

Results

The general data of gender, age, and course of disease were concordant between the control group and observation group

In control group, there were 78 male and 22 female with an age range from 40 to 78 years old and an average age of 55.4 ± 2.6 years, and 1~10 years of course of disease and 4.67 ± 1.6 years of mean course of disease. In observation group, there were 72 males

Tab. 1. Results of the general data of gender, age, and course of disease in two groups.

Parameters	Control group (n=100)	Observation group (n=100)	p
Gender (n)			
male/female	78/22	72/28	> 0.05
Age (years old/years)			
age range	40 ~ 78	42 ~82	
average age	55.4±2.6	57.4±2.8	> 0.05
Course of disease(years)			
range of course of disease	1~10	2~12	
mean course of disease	4.67±1.6	5.03±1.2	> 0.05

Tab. 2. Results of pulmonary function scores in two groups.

Parameters	Control group (n=100)	Observation group (n=100)	P
mMRC			
before treatment	3.44±0.26	3.35±0.23	
after treatment	2.23±0.22	1.83±0.24	< 0.05
CAT			
before treatment	27.77±4.02	27.33±3.91	
after treatment	24.26±3.8	20.15±3.5	< 0.05
BODE index			
before treatment	6.42 ±1.37	6.16±1.22	
after treatment	4.24±1.06	3.87±1.14	< 0.05
p		> 0.05	< 0.05

mMRC: modified British Medical Research Council Dyspnea Scale; CAT: COPD Assessment Tests; BODE: the body-mass, airflow obstruction, dyspnea, and exercise capacity index.

Tab. 3. Results of pulmonary function-related indexes in two groups.

Parameters	Control group (n=100)	Observation group (n=100)	P
FEV1 (L)			
before treatment	0.82±0.50	0.81±0.46	
after treatment	1.67±0.48	2.24±0.52	< 0.05
FVC (L)			
before treatment	1.84±0.47	1.85±0.34	
after treatment	2.26±0.68	2.93±0.45	< 0.05
FEV1/FVC (%)			
before treatment	52.11±7.26	52.35±7.25	
after treatment	58.34±7.28	66.47±8.44	< 0.05
FEV1/Pred (%)			
before treatment	60.28±8.29	60.74±8.33	
after treatment	66.88±8.36	72.45±10.18	< 0.05
p		> 0.05	< 0.05

FEV1: forced expiratory volume in 1 s; FVC: forced vital capacity; FEV1/FVC: 1 second forced expiratory volume to forced vital capacity ratio; FEV1/Pred: 1 second forced expiratory volume to predicted value ratio.

and 28 females with an age range from 42 to 82 years old and an average age of 57.4 ± 2.8 years, and 2~12 years of course of disease and 5.03 ± 1.2 years of mean course of disease. The general data of gender, age, and course of disease showed no significant difference between the two groups ($p > 0.05$) (Tab. 1), which indicated a comparability between the two groups.

Tab. 4. Results of blood gas analysis indicators in two groups.

Parameters	Control group (n=100)	Observation group (n=100)	p
PaO ₂ (mmHg)			
before treatment	74.22±13.34	73.25±13.21	< 0.05
after treatment	67.24±12.26	58.83±11.58	
PaCO ₂ (mmHg)			
before treatment	88.62±15.63	88.59±15.54	< 0.05
after treatment	80.44±15.37	71.36±15.28	
SaO ₂ (%)			
before treatment	1.26±0.11	1.24±0.10	< 0.05
after treatment	0.92±0.08	0.78±0.05	
PH			
before treatment	7.86±0.07	7.83±0.05	< 0.05
after treatment	7.55±0.03	7.12±0.01	
P value		> 0.05	< 0.05

PaO₂: oxygen partial pressure; PaCO₂: carbon dioxide partial pressure; SaO₂: oxygen saturation.

Tab. 5. Results of effectiveness evaluation after treatment in two groups (n, %).

Parameters	Control group (n=100)	Observation group (n=100)	p
Obvious validity	45 (45)	58 (58)	< 0.05
Effectiveness	38 (38)	36 (36)	> 0.05
Invalidity	17 (17)	6(6)	< 0.05
Total effective rate	83	94	< 0.05

Tab. 6. Results of Satisfaction Test after treatment in two groups (n, %).

Parameters	Control group (n=100)	Observation group (n=100)	p
Satisfaction	72 (72)	86 (86)	< 0.05
General	15 (15)	8(8)	< 0.05
Unsatisfy	13 (13)	6(6)	< 0.05
Total satisfaction rate	85.42	91.37	< 0.05

Tab. 7. Results of Quality of Life Score in two groups.

Parameters	Control group (n=100)	Observation group (n=100)	p
Daily life ability			
before treatment	30.45±4.12	30.74±4.14	< 0.05
after treatment	42.25±5.06	47.88±5.15	
Social activities			
before treatment	17.54±2.17	18.46±2.21	< 0.05
after treatment	21.22±2.10	26.18±3.04	
Depressive psychological disorders			
before treatment	22.56±2.14	22.61±2.22	< 0.05
after treatment	24.04±2.11	29.47±2.34	
Anxiety psychological disorders			
before treatment	18.77±2.25	18.95±2.34	< 0.05
after treatment	22.28±2.64	28.09±2.88	
p		> 0.05	< 0.05

Tab. 8. Results of TCM Syndrome Integral in two groups.

Parameters	Control group (n=100)	Observation group (n=100)	p
Cough			
before treatment	4.48±0.58	4.46±0.57	< 0.05
after treatment	3.66±0.54	2.17±0.25	
Expectoration			
before treatment	3.87±0.42	3.85±0.41	< 0.05
after treatment	3.28±0.37	2.07±0.40	
Wheezing			
before treatment	3.55±1.16	3.52±1.14	< 0.05
after treatment	2.81±1.01	1.35±0.42	
Chest tightness			
before treatment	3.88±0.21	3.86±0.19	< 0.05
after treatment	3.16±0.11	2.01±0.12	
Total integral			
before treatment	15.14±2.37	14.86±2.32	< 0.05
after treatment	14.26±2.33	8.25±1.73	
p		> 0.05	< 0.05

Traditional Chinese and western medicine combined with lung rehabilitation training showed a better effect on lung function than conventional western medicine combined with lung rehabilitation training in patients with COPD complicated with chronic cor pulmonale

Lung function was evaluated with mMRC dyspnea Scale, CAT, BODE index, blood gas analysis, and pulmonary function-related indexes. Firstly, before treatment, all the above parameters displayed no statistical differences between the control group and observation group ($p > 0.05$), these results ensured a comparability between the two groups (Tabs 2–4). Then, after treatment, the mMRC, CAT, and BODE index (Tab. 2) as well as the blood gas analysis indicators of PaO₂, PaCO₂, SaO₂ and PH value (Tab. 4) in the two groups all revealed a decline compared with the results before treatment, and a more pronounced downward trend was observed in the observation group ($p < 0.05$). Contrarily, increased tendencies were found after treatment in the two groups in pulmonary function-related indexes (FEV1, FVC, FEV1/FVC, and FEV1/Pred) compared with the outcomes before treatment, and the observation group showed a more marked upward trend ($p < 0.05$) (Tab. 3). Finally, after treatment, the results of mMRC, CAT, BODE index (Tab. 2), and the blood gas analysis indicators (Table 4) were lower in observation group than in control group ($p < 0.05$), while the pulmonary function-related indexes showed higher values in observation group than in control group ($p < 0.05$) (Tab. 3).

Traditional Chinese and western medicine combined with lung rehabilitation training displayed better results on evaluation of efficacy than conventional western medicine combined with lung rehabilitation training in patients with COPD complicated with chronic cor pulmonale

After treatment, the effectiveness and satisfaction were evaluated, and Quality of Life Score and TCM Syndrome Integral were performed both before treatment and after treatment to comprehensively assess the curative effect. In effectiveness evaluation,

the obvious validity and total effective rate were increased while the invalidity was decreased in observation group compared to the control group ($p < 0.05$) (Tab. 5). The Satisfaction Test results revealed that compared with the control group, the percentage of satisfaction and total satisfaction rate of the observation group were increased while the percentages of general and unsatisfied were decreased ($p < 0.05$) (Tab. 6). Additionally, before treatment, the outcomes of Quality of Life Score and TCM Syndrome Integral all showed no differences between the two groups ($p > 0.05$) (Tabs 7, 8), this indicated there was a comparability between the two groups. Compared with the results before treatment, the Quality of Life Scores (daily life ability, social activities, depressive psychological disorders, and anxiety psychological disorders) were increased in both groups after treatment ($p < 0.05$) (Tab. 7) while the TCM Syndrome Integrals (cough, expectoration, wheezing, chest tightness, and total integral) were decreased in both groups after treatment ($p < 0.05$) (Table 8), and the upward or downward trend was more obvious in the observation group (Tabs 7, 8). After treatment, the Quality of Life Score was increased in observation group compared with the control group ($p < 0.05$) (Tab. 7) while TCM Syndrome Integrals showed opposite results ($p < 0.05$) (Tab. 8).

Discussion

In the present study, we found that the patients with COPD complicated with chronic cor pulmonale treated with traditional Chinese (self-made Tonifying Lung and Kidney decoction) and Western medicine combined with lung rehabilitation training showed better lung function and curative effect than those patients managed by conventional Western medicine combined with lung rehabilitation training.

COPD often occurs in the elderly (29). A large sample of 31 provinces (autonomous regions and municipalities) in China in 2014–2015 shows approximately 90 % of people aged ≥ 40 years are at high risk for COPD (30). The newly released epidemiological survey of COPD in China in 2018 shows that the prevalence of COPD accounts for 13.7 % of the population over 40 years old. COPD incidence has increased with age so far (31). Moreover, COPD pathogenesis may be related to the long-term interaction of various environmental factors and the body's own factors, and cigarette smoking and biomass smoke exposure are the most important environmental factor in the COPD's etiology (31, 32). Apparently, the males are the main crowd of environmental factors associated with smoking and exposure to biomass smoke in China. Importantly, a nationwide, multicenter, cross-sectional questionnaire study in China in 2007–2008 also discovered that there is a gender difference on the knowledge, attitude, and practice of COPD diagnosis and treatment (33). Therefore, at the beginning of start-up of this study, we excluded some interference factors such as age, sex and course of disease to ensure that the basic data of the two groups are at the same baseline. Since the aims of this study are to compare lung function and efficacy, so, we compared the results of lung function and efficacy-related parameters between the two groups before treatment, and found that pulmonary function scores (mMRC, CAT, and BODE index), pulmonary

function-related indexes (FEV1 (L), FVC (L), FEV1/FVC (%), and FEV1/Pred (%)), blood gas analysis indicators (paO₂ (mmHg), PaCO₂(mmHg), SaO₂ (%), and PH value) (lung function), and Quality of Life Score (daily life ability, social activities, depressive psychological disorders, and anxiety psychological disorders) and TCM Syndrome Integral (cough, expectoration, wheezing, chest tightness, and total integral) (efficacy) were not statistically different between two groups before treatment, which indicated that the pulmonary function and severity were concordant before treatment between two groups and further ensured a comparability between the two groups.

Compared with the results before treatment, we discovered that both control group (conventional Western medicine combined with lung rehabilitation training) and observation group (traditional Chinese and Western medicine combined with lung rehabilitation training) showed an improvement in pulmonary function after treatment and had curative effect, especially in the observation group. Furthermore, after treatment, compared with the control group, we found the observation group exhibited better pulmonary function and curative effect. These findings illustrated that based on conventional Western medicine combined with lung rehabilitation training, traditional Chinese medicine decoction (self-made Tonifying Lung and Kidney decoction) added could promote the recovery of lung function and relief the severity of the disease, as well as ameliorate the quality of life of patients with COPD complicated with chronic cor pulmonale thus to obtain better curative effect.

As we all known, chronic cor pulmonale is a most common complication of COPD, which owing to COPD-caused reduced pulmonary vascular bed and hypoxia-induced pulmonary vasoconstriction and vascular remodeling, which leads to pulmonary hypertension, enlargement of right ventricular hypertrophy and eventually right cardiac insufficiency (34, 35). In this work, we selected the COPD patients complicated with chronic cor pulmonale as the subjects investigated, so, in the treatments by traditional Chinese medicine or Western medicine, we considered the treatment for chronic cor pulmonale by strengthening heart. In addition, COPD usually results in enhanced systemic inflammatory response especially in its aggravating period, and persistent systemic inflammation is linked to the development of comorbid chronic cor pulmonale and poorer clinical results (36). So, in conventional Western medicine treatment, we used anti-infection and anti-inflammation drugs. The COPD mainly manifested as airflow limitation and frequent respiratory symptoms, including chronic cough, expectoration, shortness of breath, dyspnea, wheezing, chest tightness (37, 38). In advanced stages of COPD, patients usually suffer from muscle wasting and weight loss (39). Therefore, in using the conventional Western medicine, it is mainly for the treatment of clinical symptoms, such as nutritional support, dispelling phlegm, relieving spasm and relieving asthma, low-flow oxygen inhalation, etc. Weightily, COPD brings the injury of lung function, seriously affects the quality of life of patients and even threatens human life (2, 40). Meanwhile, lung rehabilitation training has been proved as a major strategy to ameliorate lung function and quality of life of COPD patients in recent years (14, 15). In present work, based on the conventional Western medicine

treatment, we added lung rehabilitation training, and obtained the certain curative effect, significantly improved lung function and quality of life of patients.

In observation group, based on the control group, we added the traditional Chinese medicine decoction of self-made Tonifying Lung and Kidney. Traditional Chinese medicine believes that COPD belongs to “asthma syndrome”, “lung distention”(41), from the point of view of the pathogenesis of viscera, COPD mainly occurs in the lung and kidney, so the treatment of COPD should be based on the principles of tonifying the lung and tonifying the kidney, moistening dryness and nourishing yin, treating both manifestation and root cause, and taking both deficiency and essence into account (18, 19, 42). Here, we used a self-made Tonifying Lung and Kidney decoction to tonify lung and kidney to effectively achieve this clinical purpose. Concretely, Angelica sinensis, the root of red-rooted salvia, and Codonopsis pilosula can activate blood circulation and remove blood stasis. Houttuynia cordata can clear heat and detoxify. Astragalus mongholicus is a monarch medicine, which can replenish spleen and invigorate qi, stop sweating, invigorate qi and raise yang, enhance immune function, reduce swelling and clear lung heat. The root bark of white mulberry and Pericarpium citri reticulatae are the adjuvant drugs, they focus on clearing phlegm, promoting the circulation of qi, tonifying liver and kidney. Moreover, the root bark of white mulberry also can remove heat from lung and relieve asthma. Platycodon grandiflorum promotes the strength of the drug in the chest, play the role of lifting and lifting, tonifying qi, can clear the lung cough and pharynx. Platycodon grandiflorum promotes the strength of the drug in the chest, plays the roles of lifting and tonifying qi, can clear the lung, relieve a cough, and relieve sore throat. Fritillaria thunbergii Miq. can reduce phlegm and relieve cough. Radix Ophiopogonis can nourish yin and produce saliva. FRUCTUS CORNI and Schisandra chinensis can tonifying the kidney and nourishing qi. Poria cocos can invigorate spleen, dampness, and expectorant drink. Grilled licorice can dispel phlegm and reconcile various medicines. The combination of various drugs can enhance the adaptability of the respiratory tract to the stimulating factors in the air, promote the lung function to restore normal, achieve the effect of removing the root of phlegm and blood stasis, and play an important role in controlling the acute attack of COPD and improving the lung function. Besides, the traditional Chinese medicine therapies have exhibited the capability to ameliorate symptoms, lessen the frequency of acute exacerbation, and improve the quality of life in stable COPD (43). In our research, compared with the control group, adding the traditional Chinese medicine decoction of Tonifying Lung and Kidney has shown better lung function recovery and efficacy, better improvement in the quality of life of patients.

Nevertheless, there are still some shortcomings, such as not considering the other possible interference factors such as history of smoking and educational level of sufferers. Due to privacy issues, some patients do not cooperate to provide professional and family financial and family members support information.

Conclusions

Our self - made Tonifying Lung and Kidney decoction added promoted the rehabilitation of lung function, showed better curative effects and quality of life. Therefore, traditional Chinese and Western medicine combined with lung rehabilitation training may be a new good treatment strategy for patients with COPD complicated with chronic cor pulmonale.

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