

Efficacy of Bailing Capsule Combined with Respiratory Rehabilitation Training in the Treatment of Chronic Obstructive Pulmonary Disease and Its Impact on Patients' Blood Gas Indices and Pulmonary Function

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Abstract

Objective: To explore the clinical efficacy of Bailing Capsule combined with respiratory rehabilitation training in the treatment of chronic obstructive pulmonary disease (COPD) and its impact on patients' pulmonary function and blood gas indices. **Methods:** A total of 80 COPD patients admitted from November 2024 to November 2025 were selected. Using the random number table method, they were assigned to receive either respiratory rehabilitation training (control group) or Bailing Capsule combined with respiratory rehabilitation training (study group). **Results:** In the study group, 31 cases (77.50%) showed marked effectiveness, with a total effectiveness rate of 97.50%. In the control group, 19 cases (47.50%) showed marked effectiveness, with a total effectiveness rate of 85.00% ($P < 0.05$). The study group had FVC of (2.88 ± 0.31) L, SaO₂ of (94.25 ± 1.68) %, and PaO₂ of (80.96 ± 5.41) mmHg. The control group had FVC of (2.68 ± 0.23) L, SaO₂ of (85.42 ± 2.30) %, and PaO₂ of (76.68 ± 5.51) mmHg. There were significant differences in pulmonary function and blood gas indices between the two groups ($P < 0.05$). **Conclusion:** The use of Bailing Capsule combined with respiratory rehabilitation training in the treatment of COPD patients can achieve significant intervention effects and is of great significance in improving patients' clinical symptoms.

Keywords

Bailing Capsule; respiratory rehabilitation training; chronic obstructive pulmonary disease; blood gas indices

Chronic obstructive pulmonary disease (COPD), with a high mortality rate, is a common clinical condition. Clinically, patients usually present with symptoms such as chest tightness and wheezing, which cause damage to their airways and pulmonary blood vessels. Currently, in the clinical diagnosis and treatment of COPD patients, drug-based relief measures are often adopted to help improve patients' ventilation function and thus reduce the impact of the disease

[1]. However, although drugs play a certain role in controlling the progression of the disease, they are difficult to fundamentally and effectively address the cause of the disease and improve patients' quality of life. Therefore, clinical research on traditional Chinese medicine for the treatment of COPD has gradually been strengthened. Among them, Bailing Capsule has the effects of tonifying the lungs and kidneys and replenishing vital energy. Its application in COPD treatment can achieve significant intervention effects [2]. Meanwhile, when combined with respiratory rehabilitation training, it can further consolidate the therapeutic effects and effectively improve patients' prognostic quality. Based on this, this study conducted corresponding experiments on the application effects of Bailing Capsule combined with respiratory rehabilitation training in COPD patients, and the results are reported as follows.

1. Materials and Methods

1.1 General Information

According to the random number table method, the enrolled patients were evenly divided into two groups. The control group (40 cases) had an age range of 47-77 years, with an average age of (64.45 ± 3.62) years, including 19 males and 21 females. The study group (40 cases) had an age range of 48-76 years, with an average age of (64.12 ± 3.35) years, including 22 males and 18 females. There were no significant differences in other basic information between the two groups.

1.2 Methods

Control group: Respiratory rehabilitation training was implemented.

- **Walking exercise:** Patients were instructed to increase the swing amplitude of their arms during walking to form a 45° angle, thereby increasing the activity of the thoracic cage and shoulders and improving respiratory circulation function.
- **Breathing exercises:**
 - Patients were required to maintain a sitting position for deep breathing exercises. First, they inhaled air deeply through the nose and then exhaled slowly through the lips. During this stage, the breathing ratio should be maintained at 1:3, and the exercise time should be controlled at 10 minutes, with 3 training sessions per day.
 - Patients stood upright, placed their hands on their chests, and inhaled deeply through the nose. At the same time, during the breathing process, they should try to bulge their abdomens as much as possible while keeping the chest still. When exhaling through the lips, they should apply appropriate force to the abdomen, maintain a breathing ratio of 1:3, and control the exercise time at 10 minutes, with 3 training sessions per day.
- **Resistance training:** Patients practiced by blowing up balloons. They needed to inhale deeply as much as possible and then blow all the air into the balloon in one breath to exercise the respiratory muscles [3].

Study group: In addition to the above-mentioned exercise measures, the Bailing Capsule was also used for treatment. The drug was taken three times a day, with 4 capsules each time, and the enrolled patients needed to take it continuously for 15 days.

1.3 Observation Indicators

(1) Clinical efficacy

Marked effectiveness: Patients' clinical symptoms improved, such as dizziness and chest tightness, and significant improvements were achieved in pulmonary function indices.

Effectiveness: Patients' clinical symptoms still existed but were generally alleviated, and certain improvements were achieved in pulmonary function indices compared with those before treatment.

Ineffectiveness: Patients still had severe clinical symptoms, and their pulmonary function indices showed a deteriorating trend.

(2) Pulmonary function

Forced vital capacity (FVC), forced expiratory volume in one second (FEV1), and the ratio of the first-second expiratory volume to the vital capacity (FEV1/FVC) were measured.

(3) Blood gas indices

Arterial carbon dioxide partial pressure (PaCO_2), arterial oxygen partial pressure (PaO_2), and blood oxygen saturation (SaO_2) were measured.

1.4 Statistical Methods

SPSS 19.0 statistical software was used to process the data. Measurement data were expressed as ($\bar{x} \pm s$), and t-tests were used for comparison. The count data were expressed as percentages (%), and chi-square tests (χ^2) were used for comparison. A P-value < 0.05 indicated that the data differences were statistically significant.

2. Results

2.1 Clinical Efficacy

The study group showed significant clinical efficacy, with a marked effectiveness rate of 77.50%. The control group showed general clinical efficacy, with a marked effectiveness rate of 47.50% ($P < 0.05$) (see Table 1).

Table 1. Comparison of Clinical Efficacy (% , cases)

Group	Number of Cases	Marked Effectiveness	Effectiveness	Ineffectiveness	Total Effectiveness Rate
Study Group	40	31 (77.50)	8 (20.00)	1 (2.5)	39 (97.50)
Control Group	40	19 (47.50)	15 (37.50)	6 (15.00)	34 (85.00)
χ^2					5.846
<i>P</i>					<0.05

2.2 Pulmonary Function

The study group had an FEV1 of (2.08 ± 0.24) L and an FVC of (2.88 ± 0.31) L. The control group had an FEV1 of (1.85 ± 0.34) L and an FVC of (2.68 ± 0.23) L ($P < 0.05$) (see Table 2).

Table 2. Comparison of Pulmonary Function ($\bar{x} \pm s$)

Group	n	FEV ₁ /FVC (%)		FVC(L)		FEV ₁ (L)	
		Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment
Study Group	40	36.12 ± 3.25	59.01 ± 4.47	2.51 ± 0.44	2.68 ± 0.23	1.38 ± 0.62	1.85 ± 0.34
Study Group	40	36.11 ± 3.07	63.57 ± 4.52	2.54 ± 0.44	2.88 ± 0.31	1.35 ± 0.51	2.08 ± 0.24
<i>T</i>		0.214	5.523	0.578	4.451	0.186	3.516
<i>P</i>		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

2.3 Blood Gas Indices

The study group had an SaO₂ of (94.25 ± 1.68) %, and the control group had an SaO₂ of (85.42 ± 2.30) %. There were significant differences in blood gas indices between the two groups ($P < 0.05$) (see Table 3).

Table 3. Comparison of Blood Gas Indices ($\bar{x} \pm s$)

Group	Number of Cases	PaCO ₂ (mmHg)		PaO ₂ (mmHg)		SaO ₂ (%)	
		Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment
Study Group	40	53.25 ± 4.52	41.33 ± 3.52	59.45 ± 5.32	80.96 ± 5.41	81.36 ± 1.53	94.25 ± 1.68
Control Group	40	53.28 ± 4.55	48.24 ± 2.86	59.44 ± 5.39	76.68 ± 5.51	81.36 ± 1.43	85.42 ± 2.30
<i>T</i>		0.065	7.856	0.036	3.652	0.154	16.325
<i>P</i>		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

3. Discussion

COPD is a common disease of the respiratory system. If patients do not pay sufficient attention to the disease, it can easily lead to pulmonary heart disease, directly threatening their lives. With changes in the living environment, smoking and air pollution have become important influencing factors for COPD in patients [4]. Meanwhile, due to the continuous decline in the physical functions of the elderly, the incidence rate of COPD is relatively high, which has a negative impact on their quality of life. Although the clinic has formulated a complete set of diagnostic criteria for such diseases, no radical cure drugs have been developed yet, and patients need to take drugs for a long time to control the further development of the disease [5].

At present, in the clinical treatment of COPD, rehabilitation treatment can effectively improve patients' pulmonary function. However, from a clinical perspective, conventional intervention measures are difficult to achieve ideal exercise effects. The main reason for such adverse phenomena is that patients have relatively little understanding of rehabilitation training, and long-term drug treatment has reduced their confidence in rehabilitation. However, the application of a respiratory rehabilitation training program, with healthcare workers emphasizing the explanation of health knowledge to patients and their families and then guiding them to supervise patients' rehabilitation training, can enable patients to truly feel the effects of respiratory training from each exercise and thus enhance their exercise tolerance and effectively improve their quality of life [6]. At this stage, by combining Bailing Capsule, the important role of this drug in tonifying the kidneys and replenishing vital energy can be fully exerted, helping patients enhance their body immunity and effectively improve their hematopoietic function.

In this study, the study group showed significant clinical efficacy, with a significant difference compared with the control group ($P < 0.05$). The reason is that with the help of the combined treatment program, the synergistic effects of drugs and respiratory rehabilitation training can be fully exerted. First, this drug has the important effect of "tonifying the lungs and kidneys and replenishing vital energy". COPD patients often have a deficiency of both the lungs and the kidneys. The use of this drug can achieve the intervention effects of improving breath and calming asthma, and effectively make up for the deficiencies of past treatments. Second, after combining respiratory rehabilitation training, it can help improve the fatigue resistance of respiratory muscles and peripheral muscles, thereby effectively alleviating discomfort symptoms during activities. Especially with the help of drugs, muscle fatigue can be effectively reduced, thus improving patients' pulmonary function [7].

In terms of pulmonary function indices, there were significant differences in FEV1 and FVC between the study group and the control group ($P < 0.05$). The reason is that this drug can help patients improve their pulmonary ventilation function by enhancing muscle strength and exerting anti-inflammatory effects. When combined with rehabilitation exercises, it forms a deep-level synergy. For Bailing Capsule, it has important anti-inflammatory and antioxidant effects and can effectively inhibit the release of inflammatory mediators, thereby effectively alleviating symptoms such as congestion and edema of the airway mucosa in patients and thus promoting the effective increase in forced expiratory flow and volume [8].

In terms of blood gas indices, there were significant differences in PaO₂ and PaCO₂ between the study group and the control group ($P < 0.05$). The reason is that this drug has a powerful antioxidant effect and plays an important role in protecting the integrity of the diffusion barrier, thereby ensuring that the gas exchange function is not affected by external factors. Meanwhile, by improving pulmonary microcirculation, it can also regulate the distribution of pulmonary blood flow, thereby effectively improving oxygenation efficiency and improving patients' blood gas indices.

In conclusion, the use of Bailing Capsule combined with respiratory rehabilitation training can effectively improve the clinical symptoms of COPD, and the treatment process is safe and reliable, which is worthy of clinical promotion.

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