

Salvia Polyphenolates Combined with Doxophylline in the Treatment of Patients with Chronic Pulmonary Heart Disease in the Compensated Stage

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Abstract: *Objective:* To statistically determine the effect of salvia polyphenolates combined with doxophylline treatment in patients with chronic pulmonary heart disease in the compensated stage. *Methods:* From January 2023 to January 2024, 76 patients with chronic pulmonary heart disease in the compensated stage were selected as research subjects. The patients were divided into a research group and a reference group using a randomized numerical table method. The research group was treated with salvia polyphenolates combined with doxophylline, while the reference group received conventional therapy. The treatment effects of the two groups were compared. *Results:* The patients in the research group, treated with salvia polyphenolates combined with doxophylline, showed maximal ventilation of 73.26 ± 4.83 L/min, left ventricular ejection fraction of $56.14 \pm 1.98\%$, and total effective treatment rate of 94.74%. These results were better than those of the reference group. The differences between the data of the research group and the reference group were statistically significant ($P < 0.05$). *Conclusion:* For patients with chronic pulmonary heart disease in the compensated stage, treatment with salvia polyphenolates combined with doxophylline significantly improves maximum ventilation and left ventricular ejection fraction, and also results in a higher total effective treatment rate.

Keywords: Salvia polyphenolates; Doxophylline; Chronic pulmonary heart disease in the compensated stage

Online publication: June 25, 2024

1. Introduction

Chronic pulmonary heart disease primarily includes the compensated stage of pulmonary heart function and the decompensated stage. Patients in the compensated stage typically exhibit symptoms such as cough, sputum production, weakness, dyspnea, and palpitations. Without timely treatment, these patients can easily develop heart failure and respiratory failure. Treatment with salvia polyphenolates, extracted from Danshen (*Salvia miltiorrhiza Bunge*), combined with doxophylline, has been shown to be effective for the compensatory phase

of the disease. In this study, 76 patients with chronic pulmonary heart disease in the compensated stage, who visited the hospital between January 2023 and January 2024, were recruited as study subjects.

2. Materials and methods

2.1. General information

Seventy-six patients with chronic pulmonary heart disease in the compensated stage, who visited the hospital between January 2023 and January 2024, were recruited for the study, and their general information is shown in **Table 1** below.

Table 1. Basic data of patients with compensated stage of chronic pulmonary heart disease

Groups	Male patients (n)	Female patients (n)	Age (years)	Average age (years)
Study group (38 cases)	20	18	47–84	62.2 ± 8.4
Control group (38 cases)	19	19	46–85	64.1 ± 7.6

There was no statistically significant difference between the general information of the above two groups ($P > 0.05$). Consent was obtained from the patients and their families for this study.

2.2. Methods

2.2.1. Control group

Patients in the control group received conventional treatment, which included the use of cardiogenic agents, diuretics, anti-infective drugs, medications to correct water-electrolyte disorders, and drugs for relieving cough and resolving phlegm, administered at regular intervals and dosages^[1,2]. The treatment duration was two weeks.

2.2.2. Study group

In the study group, patients received the same conventional treatment as the reference group. Additionally, they were treated with salvia polyphenolates combined with doxophylline. This involved dissolving 200 mg of salvia polyphenolates in 250 mL of 0.9% sodium chloride injection, administered intravenously once a day. Furthermore, 200 mg of doxophylline was dissolved in 250 mL of 5% dextrose injection, also given as a slow intravenous drip once a day. The treatment duration was two weeks. During this period, patients were advised to drink more water and to quit smoking and drinking.

2.3. Observation indicators

The maximum ventilation and left ventricular ejection fraction of patients in both the study group and the reference group were compared before and after treatment. The treatment effect for patients with chronic pulmonary heart disease in the compensated stage was assessed. The criteria were as follows:

(1) Apparent effective: Symptoms are eliminated or significantly relieved; (2) Effective: Symptoms are relieved; (3) Ineffective: Symptoms are not reduced. The formula for calculating the total effective rate is: Total effective rate = [(number of apparent effects + number of effective cases) ÷ total number] × 100%.

2.4. Statistical analysis

SPSS 22.0 statistical software was used for data analysis. The t -test was applied for measurement data and expressed as mean ± standard deviation (SD), and the χ^2 test was used for count data and expressed as [n (%)]. A P value of less than 0.05 indicated statistical significance.

3. Results

3.1. Comparison of maximum ventilation and left ventricular ejection fraction before and after treatment in the two groups of patients

The maximum ventilation and left ventricular ejection fraction of patients in the study group treated with salvia polyphenolates combined with doxophylline were higher than those in the control group, and the difference between the two groups was statistically significant ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of maximum ventilation as well as left ventricular ejection fraction before and after treatment in the two groups (mean \pm SD)

Group	Before treatment		After treatment	
	Exertion spirometry (%)	Maximum expiratory volume (L/min)	Exertion spirometry (%)	Maximum expiratory volume (L/min)
Study group (38 cases)	67.43 \pm 3.62	48.12 \pm 3.45	73.26 \pm 4.83	56.14 \pm 1.98
Control group (38 cases)	66.67 \pm 3.51	47.65 \pm 3.32	70.42 \pm 4.23	52.36 \pm 1.85
<i>t</i>	0.929	0.605	2.727	8.599
<i>P</i>	0.356	0.547	0.008	0.000

3.2. Comparison of the treatment effect of patients with chronic pulmonary heart disease in the compensated stage in the two groups

Table 3 shows that the total effective treatment rate of the study group is 94.74, which is significantly higher than the control group of 78.95% ($P = 0.042$).

Table 3. Comparison of the treatment effect of patients with chronic pulmonary origin heart disease in the compensated stage in two groups [*n* (%)]

Group	Apparent effective	Effective	Ineffective	Overall effective rate
Study group (38 cases)	19 (50.00)	17 (44.74)	2 (5.26)	36 (94.74)
Control group (38 cases)	10 (26.32)	20 (52.63)	8 (21.05)	30 (78.95)
χ^2				4.146
<i>P</i>				0.042

4. Discussion

When patients with chronic pulmonary heart disease progress from the compensated stage to the decompensated stage, they may experience respiratory failure or concurrent heart failure. This not only seriously compromises the patient's health but may also be life-threatening^[3]. Therefore, patients should seek timely medical treatment upon noticing symptoms of the disease.

Salvia polyphenolates have a relaxing effect on vascular smooth muscle, dilate small bronchial arteries, reduce cardiac load, and increase blood oxygen concentration^[4-7]. Doxophylline is a bronchodilator that relaxes bronchial smooth muscle, thereby improving lung ventilation function. The combined use of these two drugs can effectively improve the condition of patients in the compensatory phase of chronic pulmonary heart disease^[8-10].

In this study, patients in the study group treated with salvia polyphenolates combined with doxophylline showed significant improvements: their maximum ventilation was 73.26 \pm 4.83 L/min, their left ventricular ejection fraction was 56.14 \pm 1.98%, and the total effective treatment rate was 94.74%. These results were significantly better than those of the control group, with a large difference between the two groups ($P < 0.05$),

indicating statistical significance.

The practice has shown that the implementation of salvia polyphenolates combined with doxophylline in the treatment of patients with chronic pulmonary heart disease in the compensatory stage significantly improves maximum ventilation and left ventricular ejection fraction, leading to high treatment efficacy.

In conclusion, patients with chronic pulmonary heart disease in the compensatory stage can improve their cardiopulmonary function and control the progression of the disease through treatment with salvia polyphenolates combined with doxophylline under medical guidance.

Disclosure statement

The authors declare no conflict of interest.

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