

# Clinical Effect of Combination Therapy of Milrinone and Nifedipine in Treating Chronic Pulmonary Heart Disease

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**Abstract:** *Objective:* To analyze the therapeutic effect achieved and the occurrence of adverse reactions in patients with chronic pulmonary heart disease treated with milrinone combined with nifedipine. *Methods:* 120 cases of chronic pulmonary heart disease patients treated in the hospital from May 2023 to February 2024 were selected as research subjects, and based on the randomized numerical table method, the 120 patients were divided into the study group and the comparison group, and the treatment of milrinone combined with nifedipine was carried out for 60 patients in the study group, and the conventional treatment was carried out for 60 patients in the comparison group, so as to make a comparison on the therapeutic effect and the occurrence of adverse reactions of patients in the two groups. The therapeutic effects and adverse reactions of the two groups were compared. *Results:* After receiving medication of milrinone combined with nifedipine, the patients in the study group had an exertional lung capacity of  $68.12 \pm 5.63\%$  and a maximal expiratory volume of  $82.41 \pm 7.84$  L/min, which were significantly higher than those in the comparison group, and the total rate of adverse reactions of the patients in the study group was 1.67%, which was significantly lower than that of the comparison group, with a *P* value of  $< 0.05$ , which is statistically significant. *Conclusion:* In the implementation of treatment for patients with chronic pulmonary heart disease, the treatment of milrinone combined with nifedipine can significantly improve the patient's exertional lung capacity and maximum expiratory volume, and the chance of adverse reactions in patients will also be significantly reduced.

**Keywords:** Milrinone; Nifedipine; Combination therapy; Chronic pulmonary heart disease

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## 1. Introduction

Chronic pulmonary heart disease is primarily caused by lesions in the lung tissue, thorax or pulmonary artery blood vessels, which then result in abnormal lung function and changes in the structure of the lung tissue while increasing pulmonary vascular resistance and pulmonary artery pressure, thus inducing heart disease.

This disease is harmful to the human body as milrinone combined with nifedipine has an inhibitory effect on phosphodiesterase. Cyclic adenosine monophosphate levels can be increased with the use of this drug and, at the same time, increase cardiac output, thus improving heart disease. In this study, 120 cases were selected from the patients with chronic pulmonary heart disease treated in Shaanxi Provincial People’s Hospital from May 2023 to February 2024 as the study subjects reported as follows.

## 2. Information and methods

### 2.1. General information

120 cases were selected from patients with chronic pulmonary heart disease treated in our hospital from May 2023 to February 2024, and their general information is shown in the following **Table 1**.

**Table 1** Basic data of patients with chronic pulmonary heart disease

Group	Male patients	Female patients	Age	Average age
Study group (60 cases)	29	31	47–82	58.7 ± 9.1
Comparison group (60 cases)	22	18	45–85	60.2 ± 8.9

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

### 2.2. Methods

#### 2.2.1. Comparison group

For patients in the comparison group, conventional treatment is implemented, with oxygen therapy, anti-infection therapy and vasodilator therapy. During the treatment period, closely monitor the patient’s vital signs, ensure the smoothness of the airway, and adhere to the treatment for 4 weeks <sup>[1–2]</sup>.

#### 2.2.2. Study group

On the basis of the implementation of conventional treatment for the patients in the study group, the implementation of milrinone combined with nifedipine treatment is done by mixing 250 mL of 9% sodium chloride injection with 13 mg of milrinone injection. It is done through the use of an intravenous drip way, according to the patient’s tolerance, to adjust the speed of drug delivery while letting the patient take nifedipine 3 times a day, each time taking 5mg, adhere to the treatment for 4 weeks.

#### 2.2.3. Observation index

Compare the exertion lung volume and maximum expiratory volume of patients in the study group and the comparison group before and after treatment, and count the occurrence of adverse reactions in patients with chronic pulmonary heart disease, including rashes, allergy, dizziness and drowsiness, and low blood pressure. The formula for calculating the total occurrence rate was:

$$\text{Total occurrence rate} = \text{number of adverse reactions} / \text{total number} \times 100\%.$$

#### 2.2.4. Statistical analysis

SPSS 22.0 statistical software was applied, *t*-test was used for the measurement data with the formula, mean ± standard deviation (SD), and  $\chi^2$  test was used for the count data (*n*/%), and  $P < 0.05$  indicated statistical

significance.

### 3. Results

#### 3.1. Comparison of exertional lung volume and maximal expiratory volume of patients before and after treatment

The exertional lung volume and maximum expiratory volume of 60 patients in the study group were significantly higher than those in the comparison group after combination treatment of milrinone and nifedipine, and the *P* of both after treatment was  $< 0.05$ , indicating that the difference between the data of the study group and the comparison group after treatment was significant and statistically significant, as shown in **Table 2**.

**Table 2** Comparison of exertional lung volume and maximal expiratory volume of patients in the study group and comparison group before and after treatment (Mean  $\pm$  SD)

Group	Before treatment		After treatment	
	Exertion spirometry (%)	Maximum expiratory volume (L/min)	Exertion spirometry (%)	Maximum expiratory volume (L/min)
Study group (60 cases)	47.62 $\pm$ 6.16	54.86 $\pm$ 7.32	68.12 $\pm$ 5.63	82.41 $\pm$ 7.84
Comparison group (60 cases)	47.53 $\pm$ 6.34	54.64 $\pm$ 7.26	57.28 $\pm$ 5.26	74.34 $\pm$ 6.48
<i>t</i>	0.079	0.165	10.898	6.146
<i>P</i>	0.937	0.869	0.000	0.000

#### 3.2. Comparison of the adverse reactions of patients

The total occurrence rate of adverse reactions of patients in the study group was 1.67%, which was significantly lower than that of the comparison group, and the difference between the data of the two groups was large, with a *p*-value of 0.028, which was statistically significant, as shown in **Table 3**.

**Table 3** Comparison of adverse reactions in patients in the study group and the comparison group (*n*, %)

Groups	Rashes allergy	Dizziness and drowsiness	Low blood pressure	Overall occurrence
Study group (60 cases)	0 (0.00)	1 (1.67)	0 (0.00)	1 (1.67)
Comparison group (60 cases)	3 (5.00)	2 (3.33)	2 (3.33)	7 (11.67)
$\chi^2$				4.821
<i>P</i>				0.028 $<$ 0.05

### 4. Discussion

Patients with chronic pulmonary heart disease usually have cough, panic, shortness of breath and weakness, and patients with more severe hypoxia may also have convulsions and coma<sup>[3-6]</sup>. Once these abnormalities occur in the body, it is necessary to go to the hospital as soon as possible to achieve early detection and treatment and avoid causing greater harm to the body.

Nifedipine belongs to the dihydropyridine calcium channel blocker, which has a good dilating effect on coronary blood vessels and peripheral blood vessels. The drug also reduces myocardial oxygen consumption and myocardial metabolism. These effects are useful in controlling the blood pressure and coronary environment. Milrinone, on the other hand, belongs to cardiotonic drugs, and when patients use the drugs, the

vital signs of patients, including blood pressure, heart rate, fluid changes, etc. have to be monitored carefully [7–10]. When the patient's blood pressure drops excessively, the infusion needs to be stopped or slowed. Through the combination treatment of milrinone and nifedipine, the cardiopulmonary function of patients will be well improved.

In this study, after receiving the combination therapy, the patients in the study group had an exertional lung capacity of  $68.12 \pm 5.63\%$  and a maximal expiratory volume of  $82.41 \pm 7.84$  L/min, which were significantly higher than those in the comparison group, and there was only one case of dizziness and drowsiness in the study group, with a total rate of 1.67%, while there were seven cases of adverse reactions in the comparison group, with a total rate of 11.67%. The total occurrence rate was 11.67%, which was significantly higher than that of the study and analysis group, with  $P < 0.05$ , which was statistically significant.

Practice shows that when milrinone and nifedipine are combined and used in treating patients with chronic pulmonary heart disease, the patients' exertional lung volume and maximum expiratory volume significantly increase, and the rate of adverse reactions is lower.

In conclusion, patients with chronic pulmonary heart disease can be treated with the combination therapy of milrinone and nifedipine under the guidance of doctors to achieve better therapeutic effects and promote the recovery of health while receiving conventional treatment.

## Disclosure statement

The authors declare no conflict of interest.

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