EFFECT OF XUEBIJING COMBINED WITH ANTIBIOTICS AND FIBEROPTIC BRONCHOSCOPE SPUTUM ASPIRATION AND LAVAGE ON SERUM INFECTION INDEXES AND INFLAMMATORY FACTORS OF ICU PATIENTS WITH SEVERE PNEUMONIA

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ABSTRACT

Objective: The purpose was to study the therapeutic effect of Xuebijing combined with antibiotics and fiberoptic bronchoscope sputum aspiration and lavage on ICU patients with severe pneumonia, and analyze its effect on serum infection indexes and inflammatory factors.

Methods: 100 patients with severe pneumonia admitted to ICU of our hospital from January 2018 to December 2019 were randomly selected and divided into control group and experimental group by drawing lots, with 50 cases in each group. The patients in the control group were treated with antibiotics combined with fiberoptic bronchoscope sputum aspiration and lavage while the experimental group was treated with Xuebijing on the basis of the control group to compare the treatment effective rates, incidence of adverse reactions, serum infection indexes (CRP and PCT) and inflammatory factors (IL-6 and IL-8) after treatment between the two groups.

Results: The treatment effective rate in the experimental group was significantly lower than that in the control group, with a statistically significant difference (P<0.05). The incidence of adverse reactions in the experimental group was significantly lower than that in the control group, with a statistically significant difference (P<0.05). The CRP and PCT expression levels in the experimental group were significantly lower than those in the control group after treatment, with statistically significant differences (P<0.05). After treatment, the IL-6 and IL-8 expression levels in the experimental group were significantly lower than those in the control group, with statistically significant differences (P<0.05).

Conclusion: Xuebijing combined with antibiotics and fiberoptic bronchoscope sputum aspiration and lavage has better therapeutic effect on ICU patients with severe pneumonia, which can significantly reduce the expression levels of serum infection indexes and inflammatory factors in patients with severe pneumonia, with high clinical application value.

Keywords: Xuebijing, antibiotics, fibrobronchoscopy, serum infection indexes, inflammatory factors.

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Introduction

Pneumonia, as a common respiratory system disease, generally affects the respiratory function of patients, resulting in significantly higher expression levels of inflammatory factors in patients under an inflammatory state[1-3]. If not treated timely, ordinary pneumonia may develop to severe pneumonia. Severe pneumonia can be caused not only by the development of ordinary pneumonia, but also by some surgically treated patients who have pulmonary infection after tracheal intubation and then develop into infectious pneumonia[4-6]. In general, patients with severe pneumonia need intensive care treatment in the ICU of the hospital, focusing on respiratory function and body inflammatory state of the patients. Patients with severe pneumonia often need to use a ventilator for mechanical ventilation, and they will secrete a large amount of sputum. In order to avoid the complications such as cough and pulmonary embolism caused by miss aspiration of sputum, sputum aspiration should be performed

in time. Fibrobronchoscopy is commonly used in clinical practice to assist in sputum aspiration[7-9]. In addition, due to the increased inflammatory factors in patients with severe pneumonia, antibiotics are necessary in the treatment process to avoid bacterial infection. Xuebijing is an antitoxic inflammatory mediator, which has a better effect on regulating the immune function of patients. Therefore, this paper took patients with severe pneumonia as the research objects to compare the therapeutic effect, adverse reactions, serum infection indexes and inflammatory factors of patients in different groups with or without Xuebijing, specifically reported as follows.

Materials and methods

General information

100 patients with severe pneumonia admitted to ICU of our hospital from January 2018 to December 2019 were randomly selected and divided into control group and experimental group by drawing lots, with 50 cases in each group. The age of patients was 21-60 years old in the experimental group and 20-60 years old in the control group. There was no statistical significance in the comparison of general information such as gender, age and complicated diseases between the two groups (P>0.05), as shown in the following table.

Group	Experimental group	Control group	X^2/t	P
Gender (male/female)	29/21	28/22	0.04	0.84
Age (years old)	46.32±4.47	46.58±4.39	0.29	0.77
Height (cm)	173.35±8.62	173.50±8.55	0.09	0.93
Weight (kg)	71.26±10.20	71.39±10.11	0.06	0.95
Smoking history (years)	3.39±1.28	3.50±1.19	0.45	0.66
Drinking History (years)	6.67±2.08	6.48±2.11	0.45	0.65
Hypertension (number of cases)	6	5	0.10	0.75
Diabetes mellitus (number of cases)	3	5	0.54	0.46
Hyperlipidemia (number of cases)	2	3	0.21	0.65

Table 1: Comparison of general data ($\bar{x}\pm s$).

Inclusion/exclusion criteria
Inclusion criteria:
• The patients had the clinical manifestations of severe pneumonia;
• The patients were aged no less than 18 years old;

• The patients had no circulatory system diseases;
• The patients had no history of drug allergy and drug abuse or bad habits;
• The study was approved by the hospital ethics committee, and all patients voluntarily participated in the study and signed the informed consent.
Exclusion criteria:
• The patients had congenital diseases;
• The patients had consciousness disorder and could not cooperate with the study;
• The patients had severe respiratory diseases recently.

Methods
All patients underwent routine ICU nursing mode with adequate nutritional support to ensure sufficient daily nutrition for patients. Patients were treated according to their condition, and patients with respiratory dysfunction were treated with mechanical ventilation via a ventilator.

Patients in the control group were treated with antibiotics combined with fiberoptic bronchoscope sputum aspiration and lavage. Due to infection by different strains in patients, patients were treated with different antibiotics. Besides, fibrobronchoscopy was used for sputum aspiration. The patients took a supine position, and the pressure of the negative pressure aspirator was adjusted. After its head was lubricated with paraffin oil, the fibrobronchoscopy was inserted from the nasal cavity into the throat and trachea of the patients for sputum aspiration.

Based on the treatment of the control group, patients in the experimental group received 100ml of Xuebijing (manufacturer: Tianjin Chasesun Pharmaceutical Co.,Ltd.; SFDA approval number: Z20040033) with 100ml of normal saline by intravenous drip for 30-40 min, twice a day, and 3-4 times a day in severe cases.

Observation indexes
The treatment effective rate, incidence of adverse reactions, serum infection indexes (CRP and PCT), and inflammatory factors (IL-6 and IL-8) after treatment were compared between the two groups. The patients had no adverse reactions during the treatment process, and inflammation and sputum basically disappeared, which was markedly effective; No adverse reactions occurred, and inflammation and sputum significantly reduced, which was effective; Significant adverse reactions occurred, and inflammation and sputum did not reduce, which was

ineffective. The normal value was 800-8000μg/L for CRP, less than 0.55ng/ml for PCT, 56.37-150.33pg/ml for IL-6 and 0.26-0.38ng/ml for IL-8[10-12].

Statistical treatment

In this study, SPSS20.0 was selected as the data processing software, and GraphPad Prism 7 (GraphPad Software, San Diego, USA) was used to draw pictures of the data. The study included count data and measurement data. The measurement data were measured by t test, expressed by ($\bar{x}\pm s$), and the count data were tested by X^2, expressed by [n(%)]. The difference was statistically significant when p<0.05.

Results

Comparison of treatment effective rates between the two groups

The comparison of the effective rates between the two groups showed that the treatment effective rate in the experimental group (92%) was significantly higher than that in the control group (76%), with a statistically significant difference (P<0.05), as shown in the following table.

Group	Markedly effective	Effective	Ineffective	Total effective rate (%)
Experimental group	27	19	4	92%
Control group	9	29	12	76%
X^2				4.76
P				0.03

Table 2: Comparison of treatment effective rates between the two groups.

Comparison of the incidence of adverse reactions between the two groups

The adverse reactions in the two groups mainly included cough, elevated body temperature and aggravated pneumonia. The incidence of adverse reactions in the experimental group was significantly lower than that in the control group, with a statistically significant difference (P<0.05), as shown in the following table.

Group	Cough	Elevated body temperature	Aggravated pneumonia	Total Incidence(%)
Experimental group	2	1	0	6%
Control group	6	7	3	16%
X^2				5.83
P				0.02

Table 3: Comparison of the incidence of adverse reactions between the two groups.

Comparison of serum infection indexes between the two groups

After treatment, the expression levels of serum infection indexes (CRP and PCT) were compared between the two groups.

The CRP and PCT expression levels in the experimental group were significantly lower than those in the control group after treatment, with statistically significant differences (P<0.05), as shown in Figure 1 and Figure 2.
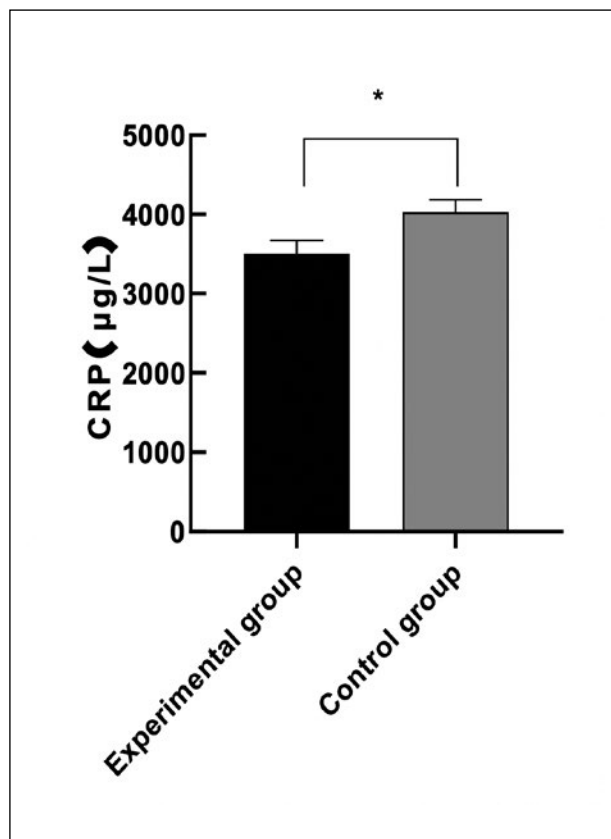

Figure 1: Comparison of CRP expression between the two groups.
*Note: The abscissa represents experimental group and control group, and the ordinate represents the CRP expression level (μg/L). *indicated the comparison of CRP expression levels between the experimental group (3505.26±168.47) μg/L and the control group (4029.61±153.88) μg/L, with a statistically significant difference (t=16.25, P<0.001).*

Comparison of inflammatory factors between the two groups

The IL-6 and IL-8 expression levels of serum inflammatory factors in the two groups were compared.

After treatment, the serum IL-6 and IL-8 expression levels in the experimental group were significantly lower than those in the control group, with statistically significant differences (P<0.05), as shown in Figure 3 and Figure 4.
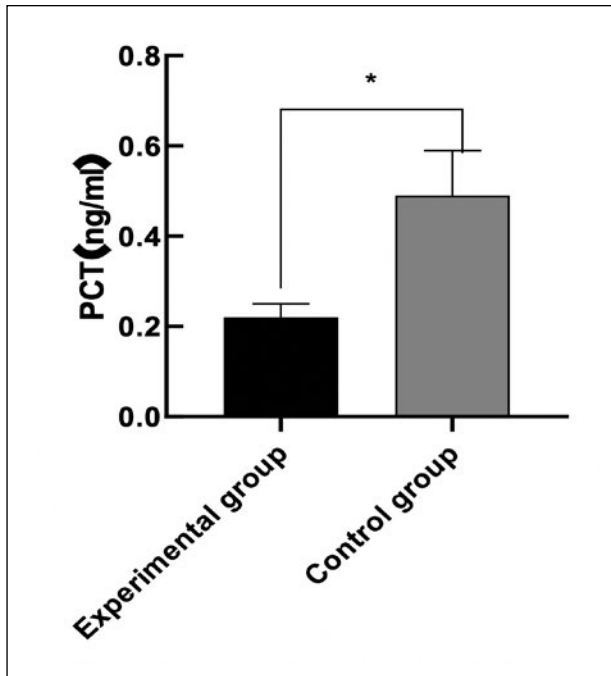
Figure 2: Comparison of PCT expression between the two groups.
*Note: The abscissa represents experimental group and control group, and the ordinate represents the PCT expression level (ng/ml). *indicated the comparison of PCT expression levels between the experimental group (0.22±0.03) ng/ml and the control group (0.49±0.10) ng/ml, with a statistically significant difference (t=18.29, P<0.001).*
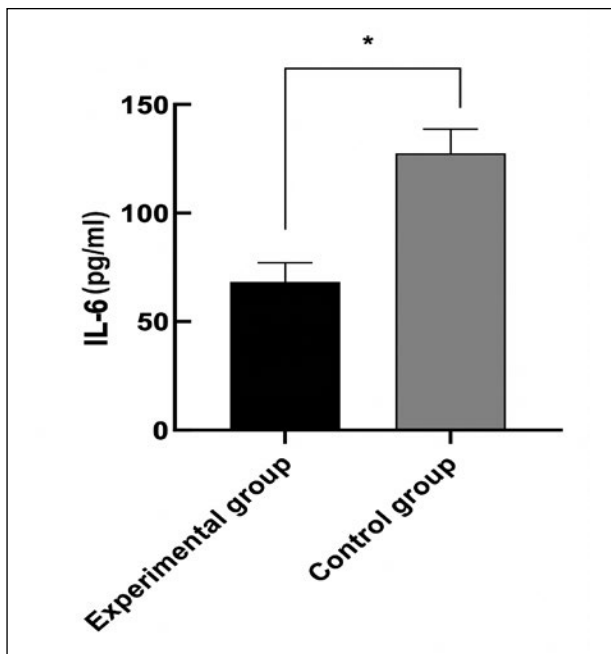

Figure 3: Comparison of IL-6 expression levels between the two groups.
*Note: The abscissa represents experimental group and control group, and the ordinate represents the IL-6 expression level (pg/ml). *indicated the comparison of IL-6 expression levels between the experimental group (68.29±8.81)pg/ml and the control group (127.62±11.06)pg/ml, with a statistically significant difference (t=29.67, P<0.001).*
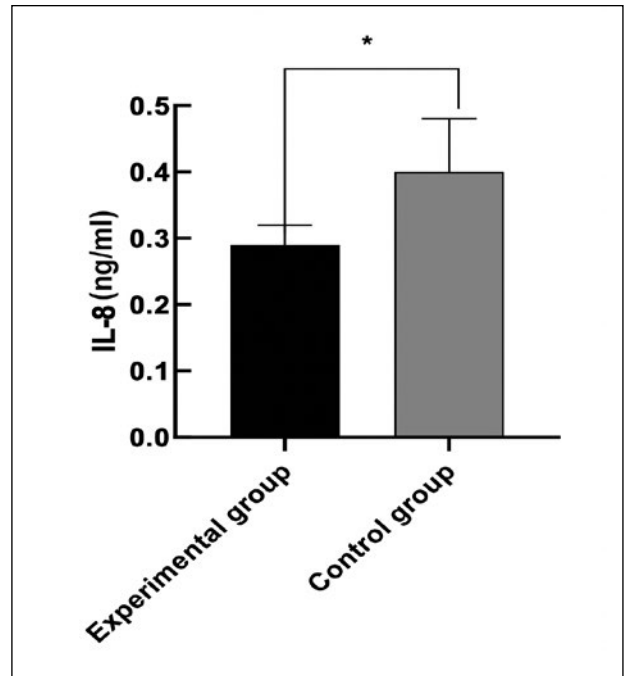

Figure 4: Comparison of IL-8 expression levels between the two groups.
*Note: The abscissa represents experimental group and control group, and the ordinate represents the IL-8 expression level (ng/ml). *indicated the comparison of IL-8 expression levels between the experimental group (0.29±0.03)ng/ml and the control group(0.40±0.08)ng/ml, with a statistically significant difference (t=9.10, P<0.001).*

Discussion

Common manifestations of pneumonia include cough, expectoration and loud lung wheezing, which may affect respiratory frequency in severe cases, leading to respiratory failure and respiratory disturbance. If respiratory failure occurs in patients with pneumonia, a ventilator is needed for mechanical ventilation, and they should be immediately transferred to the intensive care unit (ICU) for treatment and nursing. Therefore, patients with severe pneumonia often need to be treated in ICU[13-15]. Since patients with severe pneumonia are often accompanied by a large amount of sputum secretion, complications such as cough, miss aspiration of sputum and infection often occur if the sputum in patients is not cleaned in time[16-19].

Meanwhile, sputum itself is liquid formed by mixing bronchial secretion with dust and impurities in the air, aggravating the patients' condition when staying in the body for long time. Therefore, sputum produced from the trachea, bronchi and the lungs should be promptly cleared in patients with severe pneumonia. Fiberoptic bronchoscope sputum aspiration is a way to absorb the sputum in

the bronchus of patients through fibrobronchoscopy combined with negative pressure device, which is commonly used in clinical practice and often combined with antibiotics for treatment. The main role of antibiotics is to fight against bacteria and reduce the probability of infection in patients[20-22]. Xuebijing is often used in clinical treatment to deal with toxinfection and improve immunity. In order to study the application effect of Xuebijing combined with antibiotics and fiberoptic bronchoscope sputum aspiration and lavage in patients with severe pneumonia, this paper took patients with severe pneumonia as the research objects and analyzed the effect of Xuebijing on expression levels of serum infection indexes and inflammatory factors.

The results of this study showed that treatment effective rate and the incidence of adverse reactions in the experimental group treated with Xuebijing combined with antibiotics were significantly better than those in the control group without Xuebijing, with statistically significant differences (P<0.05), indicating that Xuebijing combined with antibiotics and fiberoptic bronchoscope sputum aspiration and lavage can improve the treatment effective rate and reduce the incidence of adverse reactions, so as to provide a relatively safe and effective treatment method for patients. In addition, comparison of the serum infection indexes (CRP and PCT) and inflammatory factors (IL-6 and IL-8) between the two groups showed that the expression levels in the experimental group in this study were all significantly lower than those in the control group, with statistically significant differences (P<0.05), indicating that Xuebijing combined with antibiotics and fiberoptic bronchoscope sputum aspiration and lavage can significantly reduce the expression levels of serum infection indexes and inflammatory factors in patients, and can obviously improve the inflammatory manifestations and reduce the risk of infection-related complications in patients.

Scholars Li Guangwen et al[23] suggested in their study that the serum infection indexes and stress hormone levels of patients with severe pneumonia treated with Xuebijing combined with antibiotics were significantly lower than those of patients treated with antibiotics alone, with statistically significant differences (P<0.05). The conclusion is consistent with the that of this paper as for serum infection indexes of patients, which fully demonstrates the scientificity and reliability of the results in this paper.

In conclusion, Xuebijing combined with antibiotics and fiberoptic bronchoscope sputum

aspiration and lavage has better therapeutic effect on ICU patients with severe pneumonia, which can significantly reduce the expression levels of serum infection indexes and inflammatory factors in patients with severe pneumonia, with high clinical application value. Therefore, it is worthy of promotion and application in clinic.

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