Application Study of Nebulized Low-Dose Azithromycin in the Treatment of Community-Acquired Pneumonia

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Abstract: Objective: To analyze the effect of nebulized low-dose azithromycin in the treatment of community-acquired pneumonia. Methods: The selected research subjects were 68 patients with community-acquired pneumonia admitted to our hospital from January 2020 to January 2021. The patients were divided into control group and experimental group by random number table method. The control group was treated with normal saline inhalation (34 cases), and the experimental group was treated with aerosol low-dose azithromycin (34 cases). The treatment effects of the two groups were compared. Results: There were significant differences in the effective rates of treatment between the two groups, and the experimental group was higher (P<0.05). There were significant differences in inflammatory cytokine indexes between the two groups, and the experimental group was lower (P<0.05). Conclusion: The treatment effect of low-dose azithromycin in the treatment of patients with community-acquired pneumonia is definite, and it can be applied and promoted in clinical practice.

Keywords: Nebulized Low-Dose Azithromycin; Community-Acquired Pneumonia; Treatment Response Rate; Inflammatory Cytokines

Introduction

Community-acquired pneumonia is an inflammation of the lungs caused by infections such as bacteria, mycoplasma, and chlamydia outside the hospital. Symptoms of the disease include nasal congestion, sneezing, and sore throat, as well as cough, hemoptysis, and chest pain. If the patient does not receive timely and effective treatment, a variety of serious complications can occur, such as meningitis and pericarditis, which can threaten the patient's life in severe cases. The current clinical treatment of this disease is mostly antibacterial drugs, which can obtain a certain therapeutic effect, but it is very prone to adverse reactions [1]. For this reason, the selected research subjects were 68 patients with community-acquired pneumonia who were admitted to our hospital from January 2020 to January 2021. To analyze the effect of nebulized low-dose azithromycin in the treatment of community-acquired pneumonia. The results of the study are detailed below.

1. Materials and methods

1.1 Basic information

The selected research subjects were 68 patients with community-acquired pneumonia admitted to our hospital from January 2020 to January 2021. The patients were divided into control group and experimental group by random number table method. The control group was treated with normal saline inhalation (34 cases), and the experimental group was treated with aerosol low-dose azithromycin (34 cases). Among them, there were 16 males and 18 females in the experimental group, aged 34-68 years, with an average of (45.65±3.25) years. The control group consisted of 17 males and 17 females, aged 35-66 years, with an average of (45.54±3.65) years. After statistical analysis, there was no significant difference in the basic data

between the two groups (P>0.05).

1.2 Methods

1.2.1 Control group

The group received normal saline inhalation therapy, and the patients were given anti-infection, antitussive and antiasthmatic treatment. Treat every 2-3 days.

1.2.2 Experimental group

The group received normal saline inhalation therapy, and the patients were given anti-infection, antitussive and antiasthmatic treatment. Treat every 2-3 days.

1.3 Performance criteria

(1) Evaluate the therapeutic effect according to the improvement of the patient's symptoms, markedly effective means that the symptoms disappear, effective means that the symptoms are improved ideally, and ineffective means that the symptoms have not improved. Calculation method: (markedly effective + effective)/total number of cases × 100%.

(2) Observe the inflammatory cytokine indexes of patients after treatment, including TNF-α, IL-6 and IL-8.

1.4 Statistical methods

The data obtained in the study were processed by SPSS 23.0 software. ($\bar{x}$±s) is used to represent measurement data, using t test; (%) is used to represent count data, using (x^2) test. When the calculated P<0.05, it was suggested that there was a significant difference between the compared subjects.

2. Results

1.5 Comparison and analysis of the effective rate of treatment between the two groups

There were significant differences in the effective rates of treatment between the two groups, and the experimental group was higher (P<0.05). See Table 1 for details.

Table 1 Comparative analysis of the effective rate of treatment between the two groups [n, (%)]

Groups	Number of cases	Markedly effective	Effective	Invalid	Treatment effective rate (%)
Experimental group	34	24（70.59%）	8（23.53%）	2（5.88%）	94.12%（32/34）
Control group	34	17（50.00%）	7（20.59%）	10（29.41%）	70.59%（24/34）
χ^2	-	3.009	0.085	6.476	6.476
P	-	0.083	0.770	0.011	0.011

1.6 Comparative analysis of inflammatory cytokine indexes between two groups

There were significant differences in inflammatory cytokine indexes between the two groups, and the experimental

group was lower (P<0.05). See 2 for details.

Table 2 Comparative analysis of inflammatory cytokine indexes between the two groups($\bar{x} \pm s$)

Groups	Number of cases	TNF-α（pg/ml）	IL-6（pg/ml）	IL-8（pg/ml）
Experimental group	34	23.45±4.32	18.76±5.42	7.65±2.36
Control group	34	13.43±4.46	13.42±5.68	3.26±1.87
t	-	9.409	3.966	8.501
P	-	0.001	0.001	0.001

3. Discussion

Pneumonia is a common clinical disease that endangers human health. Due to the abuse of antibiotics and the continuous increase of drug-resistant bacteria, the incidence of the disease is increasing. Community-acquired pneumonia is caused by infection with pathogenic microorganisms outside the hospital, and its symptoms include nasal congestion, sneezing, and sore throat, which can seriously affect the quality of life of patients. Azithromycin is a macrolide antibacterial drug. This drug has a high antibacterial effect on Gram-positive bacteria and Gram-negative bacteria. At the same time, it has a long half-life. Taking a small amount of drug every day can achieve the minimum inhibitory concentration [2].

Relevant studies have pointed out that the physical and chemical properties of azithromycin aerosol particles can be administered by inhalation, and sufficient lung deposition can be achieved [3]. Another study showed that aerosolized azithromycin administration has a good feasibility. Compared with the same dose of oral administration, the drug concentration of nebulized administration in alveolar macrophages and pulmonary epithelial mucous layer is higher, and the plasma drug concentration is lower [4]. The results of this study showed that there were significant differences in the effective rates of treatment between the two groups, and the experimental group was higher (P<0.05). It is suggested that nebulized low-dose azithromycin treatment can improve the treatment efficiency of patients. There were significant differences in inflammatory cytokine indexes between the two groups, and the experimental group was lower (P<0.05). It is suggested that aerosol low-dose azithromycin treatment can reduce inflammatory cytokine indexes, which are closely related to bacterial infection. Taking low-dose azithromycin aerosol treatment can reduce the production of cytokines by M1 airway epithelial cells, and inhibit the apoptosis of human leukocytes and lymphocytes. , Inhibit the formation of natural killer cells, thereby reducing the production of inflammatory cytokines such as IL-8 and TNF-α by monocytes, thereby improving the related symptoms of patients and promoting their recovery.

In conclusion, the treatment effect of aerosol low-dose azithromycin in the treatment of patients with community-acquired pneumonia is definite, and it can be applied in clinical practice.

References

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