

The Effect of Azithromycin in Treating Mycoplasma Pneumonia in Children

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Abstract: *Objective:* To discuss and analyze the effect of azithromycin in the treatment of mycoplasma pneumonia in children. *Methods:* A total of 120 children with mycoplasma pneumonia who were admitted to the Department of Pediatrics of our hospital from January 2022 to December 2022 were selected as the research subjects. They were divided into an azithromycin group and a reference group according to the random number drawing method, with 60 cases in each group. The azithromycin group was treated with azithromycin, and the reference group was treated with conventional treatment. The efficacy of treatment, laboratory indicators, platelet count and D-dimer, and adverse reactions of both groups were compared. *Results:* The efficacy of the azithromycin group was significantly higher than that of the reference group ($P < 0.05$). Before treatment, there were no significant differences in the laboratory indicators like ferritin, procalcitonin (PCT), and erythrocyte sedimentation rate (ESR) between the two groups ($P > 0.05$); after treatment, the laboratory indicators of the azithromycin group were significantly better than those of the reference group ($P < 0.05$). Before treatment, there was no statistically significant difference in platelet count and D-dimer between the groups ($P > 0.05$); after medication, the platelet count, and D-dimer in the azithromycin group were significantly better than those in the reference group ($P < 0.05$). The total incidence of adverse reactions in the azithromycin group was significantly lower than that in the reference group ($P < 0.05$). *Conclusion:* Azithromycin is more effective in treating mycoplasma pneumonia in children, and has certain clinical value.

Keywords: Azithromycin; Treatment; Mycoplasma pneumonia in children

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1. Introduction

Mycoplasma pneumonia is a common disease in children. This disease is caused by an infection by mycoplasma, which can cause inflammation in the bronchi and alveoli, and this disease is transmitted through respiratory droplets^[1]. The severity of infection varies among different children, leading to differences in symptoms. Severe pneumonia can cause damage to other systems, leaving sequelae in children, and, in some cases, even fatality^[2]. Infectious diseases are usually treated with antibiotics. Prolonged use of antibiotics will lead to drug resistance, so they should be used with caution^[3,4]. Azithromycin is a macrolide drug that

is effective against many types of bacteria. It can be used to treat mycoplasma pneumonia in children and eliminate pulmonary infection [5]. The purpose of this study was to analyze the effect of azithromycin in the treatment of mycoplasma pneumonia in children.

2. General information and methods

2.1. General information

A total of 120 children with mycoplasma pneumonia who were admitted to the Department of Pediatrics of our hospital from January 2022 to December 2022 were selected as the research subjects. They were divided into the azithromycin group and the reference group according to the random number drawing method, with 60 cases in each group. The azithromycin group consisted of 29 males and 21 females aged 1–5 years old, with an average age of 3.02 ± 0.22 years; the course of the disease was 2–5 days, with an average duration of 3.26 ± 0.34 days. The reference group consisted of 28 males and 22 females, aged 1–6 years old, with an average age of 3.05 ± 0.18 years; the course of the disease was 2–4 days, with an average duration of 3.34 ± 0.39 days. There was no statistically significant difference in the general information between the two groups ($P > 0.05$).

Inclusion criteria: (1) children diagnosed with mycoplasma pneumonia, (2) signed an informed consent, (3) not allergic to the therapeutic drugs used.

Exclusion criteria: (1) presence of pulmonary failure, (2) presence of congenital heart disease, (3) presence of abnormal liver and kidney function.

2.2. Methods

All children were given symptomatic treatment to relieve cough, asthma, and spasms, and reduce phlegm.

The reference group underwent conventional treatment: intravenous infusion of 20–30mg·kg erythromycin in 250 mL normal saline. The treatment lasted for a week.

The azithromycin group was treated with azithromycin: intravenous infusion of 10mg·kg azithromycin in 250 mL normal saline. The treatment lasted for a week.

2.3. Observation indicators

- (1) The efficacy of the treatment received in the two groups was compared, and the efficacy was evaluated using the following description: markedly effective (normal body temperature, disappearance of symptoms, no sign of disease), effective (significant improvement in the symptoms, with some signs remaining), and ineffective (abnormal body temperature, severe symptoms and signs).
- (2) The laboratory indicators of both groups were compared, including ferritin, procalcitonin (PCT), and erythrocyte sedimentation rate (ESR).
- (3) Platelet counts and D-dimer were compared between groups.
- (4) The rate of adverse reactions was compared between groups, including nausea and vomiting, rash, diarrhea, and abnormal liver function.

2.4. Statistical analysis

The data were processed and analyzed using SPSS 21.0. Count data were presented as the number of cases (n) and percentages (%), and analyzed with the chi-squared (χ^2) test. Measurement data were expressed as mean \pm standard deviation and analyzed using the t -test. Statistical significance was defined as $P < 0.05$.

3. Results

3.1. Treatment efficacy

Azithromycin showed a higher efficacy compared to conventional treatment ($P < 0.05$), as shown in **Table 1**.

Table 1. The comparison of the efficacy of treatment received in the two groups (n [%])

Group	Number of cases	Markedly effective	Effective	Ineffective	Total efficacy
Azithromycin group	60	43 (71.67)	16 (26.67)	1 (1.67)	59 (98.33)
Reference group	60	35 (58.33)	18 (30.00)	7 (11.67)	53 (88.33)
χ^2	-	-	-	-	4.8214
P	-	-	-	-	0.0281

3.2. Laboratory indicators

Before treatment, there were no significant differences in the laboratory indicators like ferritin, PCT, and ESR between the two groups, ($P > 0.05$); after treatment, the laboratory indicators of the azithromycin group were significantly better than those of the reference group ($P < 0.05$), as shown in **Table 2**.

Table 2. The comparison of laboratory indicators between groups is as follows (mean \pm standard deviation)

Group	Number of cases	Ferritin (g/L)		PCT (ug/L)		ESR (mm/h)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Azithromycin group	60	2.34 \pm 0.52	2.52 \pm 0.42	0.57 \pm 0.25	0.12 \pm 0.08	25.84 \pm 0.43	12.57 \pm 0.54
Reference group	60	2.35 \pm 0.41	2.86 \pm 0.42	0.59 \pm 0.21	0.24 \pm 0.06	25.76 \pm 0.36	16.22 \pm 0.69
t	-	0.1169	4.4339	0.4744	9.2951	1.1049	32.2680
P	-	0.9071	0.0000	0.6360	0.0000	0.2714	0.0000

3.3. Platelet count and D-dimer

Before treatment, there was no statistically significant difference in platelet count and D-dimer between the groups ($P > 0.05$); after medication, the platelet count and D-dimer in the azithromycin group were significantly better than those in the reference group ($P < 0.05$), as shown in **Table 3**.

Table 3. The comparison of platelets and D-dimer between the two groups (mean \pm standard deviation)

Group	Number of cases	Platelet count		D-dimer	
		Before treatment	After treatment	Before treatment	After treatment
Azithromycin group	60	275.54 \pm 30.54	200.31 \pm 25.61	1.33 \pm 0.15	0.49 \pm 0.21
Reference group	60	275.95 \pm 30.24	235.44 \pm 28.57	1.36 \pm 0.25	0.84 \pm 0.35
t	-	0.0738	7.0922	0.7970	6.6421
P	-	0.9412	0.0000	0.4270	0.0000

3.4. Rate of adverse reactions

The total incidence of adverse reactions in the azithromycin group was significantly lower than that in the reference group ($P < 0.05$), as shown in **Table 4**.

Table 4. The comparison of adverse reactions between the two groups (*n* [%])

Group	Number of cases	Nausea and vomiting	Rash	Diarrhea	Abnormal liver function	Total incidence
Azithromycin group	60	1 (1.67)	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.67)
Reference group	60	3 (5.00)	2 (3.33)	3 (5.00)	0 (0.00)	8 (13.33)
χ^2	-	-	-	-	-	5.8859
<i>P</i>	-	-	-	-	-	0.0152

4. Discussion

Mycoplasma pneumoniae is a microorganism that mainly hosts and reproduces in the respiratory tract and can cause mycoplasma [6]. The immune function of children is not fully developed, so they are easily infected by pathogenic bacteria. Mycoplasma pneumonia occurs when *Mycoplasma pneumoniae* invades the respiratory tract. The main symptoms of the disease are cough, fever, and expectoration. Symptoms such as dyspnea and wheezing may also occur in severe cases [7]. Mycoplasma pneumonia can cause cell damage and produce an inflammatory response in the respiratory tract or lungs, so the level of inflammatory indicators in the body will increase significantly [8]. The pathogenic bacteria of mycoplasma pneumoniae can affect the state of platelets, and the blood is in a state of high aggregation, which in turn leads to an increase in the level of D-dimer [9,10]. Azithromycin has an anti-inflammatory effect, and it reduces inflammatory factors. It is effective in treating children with mycoplasma pneumonia in a smaller dose, therefore avoiding antibiotic overdose [11,12]. Azithromycin can lower the platelet count, improve the hypercoagulable state of the blood, and restore the normal operation of the blood system [13]. Mycoplasma pneumonia can lead to abnormalities in indicators such as ferritin, PCT, and ESR. In our study, the above indicators were significantly improved after treatment with azithromycin, demonstrating its ability to eliminate bacterial infection.

Azithromycin is effective against many types of bacteria, but it is particularly effective against *Mycoplasma pneumoniae*, so it is widely used in the treatment of mycoplasma pneumonia in children. The drug demonstrates a significant ability to control the inflammatory response caused by *Mycoplasma pneumoniae*. It effectively reduces abnormal laboratory indicators, helps restore a balanced blood profile, and brings the body back to a normal state. Moreover, it boasts a high level of safety, with adverse reactions in children being exceptionally rare [14,15].

5. Conclusion

In conclusion, azithromycin proves highly effective in treating mycoplasma pneumonia in children. It effectively suppresses the inflammatory response, contributes to the recovery of platelets and D-dimer levels, and maintains an excellent safety profile. This treatment program merits broad clinical application.

Disclosure statement

The authors declare no conflicts of interest.

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