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# Analysis of Clinical Characteristics of Mycoplasma Pneumoniae Pneumonia in Children Under Two Years of Age

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**Abstract:** *Objective*: To analyse the clinical characteristics of *Mycoplasma pneumoniae* pneumonia (MPP) in children under two years of age. *Methods*: A retrospective analysis was conducted on 112 paediatric cases of MPP admitted to our hospital between January 2022 and December 2023. Clinical data including symptoms, signs, imaging findings, and prognosis were collected. *Results*: Analysis of clinical symptom distribution revealed coughing in 100.0% of cases, comprising both paroxysmal dry cough and productive cough. Fever was present in 61.61% of cases, with additional manifestations including wheezing, vomiting, diarrhoea, and respiratory distress. Pulmonary rales were the most prevalent finding at 75.89%, alongside other signs such as diminished breath sounds. Imaging analysis of all 112 pneumonia cases revealed bronchopneumonia accounted for 70.54% of cases, representing a relatively high proportion. Treatment involved macrolide antibiotics, including azithromycin, with bronchodilators and corticosteroids added for significant wheezing. The overall treatment efficacy rate was 90.18%. *Conclusion*: Analysis of *Mycoplasma pneumoniae* characteristics in children under 2 years indicates that MPP in infants and young children under 2 presents with mild symptoms, pronounced signs, and relatively mild overall inflammation, resulting in a comparatively high overall cure rate.

**Keywords:** Mycoplasma pneumoniae in children; Clinical characteristics; Analysis

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## 1. Introduction

*Mycoplasma pneumoniae* (MP), a primary pathogen in community-acquired pneumonia among children, typically affects school-aged children. Epidemiological data indicates increasing incidence of MPP in infants and young children, making it a current paediatric focus [1]. In this age group, the immature immune system and narrower airways result in clinical manifestations differing from those in older children, leading to a higher risk of misdiagnosis or missed diagnosis. Furthermore, laboratory tests and imaging characteristics for MPP in infants

and young children exhibit distinct features. Inadequate awareness among clinicians may compromise treatment decisions [2]. Research on MPP in children under two years of age remains limited. This study analyses data from 112 paediatric MPP cases under two years old, identifying pathological patterns and diagnostic/therapeutic key points to inform early clinical symptom recognition [3].

## 2. Materials and methods

### 2.1. General data

A total of 112 paediatric MPP cases admitted to our hospital between January 2022 and December 2023 were statistically analysed. The inclusion criteria are as follows:

(1) Children aged under 24 months;
(2) Meeting the MPP diagnostic criteria outlined in the 'Diagnostic and Treatment Guidelines for Community-Acquired Pneumonia in Children';
(3) Complete clinical records.

The exclusion criteria are as follows:

(1) Concurrent bacterial, viral, or other pathogen infections;
(2) Underlying conditions such as congenital heart disease;
(3) Patients with incomplete follow-up data.

### 2.2. Methods

A retrospective analysis was conducted to collect clinical data, specifically including:

(1) General information: Gender, age, onset time;
(2) Clinical symptoms: Cough, fever, wheezing, dyspnoea, and diarrhoea;
(3) Physical findings: Pulmonary rales, diminished breath sounds, pleural friction rub, cyanosis;
(4) Imaging studies: Chest X-ray and CT findings, jointly interpreted by radiologists;
(5) Treatment and prognosis: Therapeutic outcomes [4].

### 2.3. Data processing

SPSS statistical software (Version 22.0) was employed. Quantitative indicators were analysed using t-tests. Statistical significance was defined as $P < 0.05$ for comparable indicators before and after intervention.

## 3. Results

### 3.1. Clinical data

Among 112 paediatric MPP cases, the male-to-female ratio was 65:47. The mean age was 15.30 ± 6.42 months. Autumn was the most prevalent season, accounting for 47.32% of cases.

### 3.2. Clinical symptoms

Analysis of symptom distribution across both groups revealed coughing present in 100.0% of cases, comprising paroxysmal dry cough, productive cough, and wheezing. Fever was reported in 61.61% of cases. Additional symptoms included vomiting, diarrhoea, and dyspnoea (**Table 1**).

**Table 1.** Distribution of clinical symptoms in 112 paediatric patients

| Symptom | Number of cases (n) | Proportion (%) |
|---|---|---|
| Cough | 112 | 100.00 |
| Paroxysmal dry cough | 68 | 60.71 |
| Productive cough | 44 | 39.29 |
| Wheezing | 77 | 68.75 |
| Fever | 69 | 61.61 |
| Low-grade fever (37.3–38°C) | 28 | 25.00 |
| Moderate fever (38.1–38.9°C) | 19 | 16.96 |
| High fever (≥ 39°C) | 14 | 12.50 |
| Vomiting | 16 | 14.29 |
| Diarrhoea | 12 | 10.71 |
| Shortness of breath | 21 | 18.75 |
| Lethargy | 8 | 7.14 |

## 3.3. Clinical signs

Analysis of clinical sign distribution among 112 paediatric patients revealed pulmonary rales as the most prevalent finding at 75.89%, alongside other manifestations, including diminished breath sounds (**Table 2**).

**Table 2.** Distribution of clinical characteristics in 112 paediatric patients

| Signs | Number of cases (n) | Proportion (%) |
|---|---|---|
| Lung crackles | 85 | 75.89 |
| Diminished breath sounds | 25 | 22.32 |
| Pleural friction rub | 2 | 1.79 |
| Cyanosis | 7 | 6.25 |
| No positive physical findings | 3 | 2.68 |

## 3.4. Imaging findings and distribution of pneumonia types

Analysis of imaging findings in 112 cases of pneumonia revealed that bronchopneumonia accounted for 70.54% of these cases, representing a relatively high proportion (**Table 3**).

**Table 3.** Radiographic manifestations in 12 cases of pneumonia

| Imaging findings | Number of cases (n) | Proportion (%) |
|---|---|---|
| Bronchopneumonia | 79 | 70.54 |
| Lobar pneumonia | 28 | 25.00 |
| Interstitial pneumonia | 5 | 4.46 |
| With small amounts of pleural effusion | 3 | 2.68 |

### 3.5. Treatment and prognosis

Treatment of 112 paediatric pneumonia cases primarily involved macrolide antibiotics for infection control, including azithromycin. Bronchodilators and corticosteroids were added for patients exhibiting significant wheezing. The overall treatment efficacy rate was 90.18% (**Table 4**).

**Table 4.** Treatment and prognosis of 12 paediatric pneumonia cases

| Therapeutic efficacy | Number of cases (n) | Proportion (%) |
|---|---|---|
| Cured | 82 | 73.21 |
| Improved | 19 | 16.96 |
| No effect | 11 | 9.82 |
| Overall response rate | 101 | 90.18 |

## 4. Discussion

MP is a common pathogen widely prevalent in human populations. MPP constitutes a community-acquired pneumonia, accounting for 10% to 40% of all pneumonia cases. In recent years, the widespread use of antibiotics has led to an increasing prevalence of drug-resistant strains of MPP, presenting new challenges for clinical management [5]. Moreover, the pathogenesis of MPP remains incompletely understood, involving pathogen adhesion, cytotoxicity, cellular immunity, and humoral immunity. Consequently, an in-depth investigation into the clinical management of MPP holds significant importance. As a prevalent disease at present, MP frequently affects the skin, gastrointestinal tract, and cardiovascular system. Laboratory investigations should incorporate pathogen detection, yielding favourable overall outcomes [6].

MPP, a prevalent respiratory infection, is particularly common among children and adolescents. MPP primarily spreads via droplet transmission, presenting with symptoms including dyspnoea, cough, and fever. Severe cases may lead to complications such as pleurisy and pneumonia. The widespread use of antibiotics has resulted in increased resistance strains of MPP, posing significant challenges [7].

This study indicates that children under two years old are particularly susceptible to MPP. This is primarily due to the gradual waning of maternal immunity during this age period, coinciding with the establishment of their own immune systems. Concurrently, their increased mobility and exposure to environmental pathogens contribute to susceptibility. The disease exhibits seasonal prevalence, with autumn being the peak season. This correlates with the transmission characteristics of MP, which spreads via airborne transmission. Consequently, respiratory mucosa is significantly influenced by environmental factors, heightening susceptibility to infection.

Clinical features of MPP in children under two exhibit distinct characteristics. The core symptom is coughing, manifesting as either dry or productive coughs, primarily due to infants' limited mucus clearance capacity and abundant airway secretions. The overall incidence of wheezing generally reaches 68.75%. MP infection readily induces increased secretions, mucosal oedema, and wheezing episodes in affected children [8].

Among febrile patients, low-grade fever predominates, with high fever being relatively uncommon. Systemic toxic symptoms are mild, largely due to the relatively mild nature of MP reactions. Additionally, some children present with diarrhoea and vomiting, necessitating clinical differentiation from intestinal infections. On examination, pulmonary auscultation reveals predominantly moist rales, differing from the pleural involvement seen in older children. This relates to the immature development of the pleura in infants and young children,

necessitating differentiation from intestinal infections [9].

Typical radiological features of MPP in infants and young children are bronchopneumonia, differing from the lobar pneumonia presentation seen in older children with MPP. Bronchopneumonia is primarily associated with the airway structure in infants and young children, while lobar pneumonia generally indicates a more severe overall condition and is prone to complications. Interstitial pneumonia requires differentiation from other infections [10]. Macrolide antibiotics are the first-line treatment, with azithromycin and erythromycin generally yielding favourable overall outcomes. For unresponsive cases, further investigation and adjustment should incorporate pathogen-specific testing. MPP in children under two years presents distinct clinical features, predominantly occurring in autumn, characterised by wheezing, high fever, and inflammatory responses. Imaging findings predominantly reveal bronchopneumonia, with macrolide antibiotics demonstrating effective treatment outcomes. Early diagnosis and intervention are crucial for improving prognosis [11].

## 5. Conclusion

In summary, this study of 112 pediatric patients under two years of age confirms that MPP presents with distinct clinical features in this young population. The most prominent symptom was cough, present in all cases, while wheezing and fever were also common. Imaging findings predominantly indicated bronchopneumonia. Treatment with macrolide antibiotics, primarily azithromycin, supplemented with bronchodilators and corticosteroids for severe cases, yielded a favorable overall response rate of 90.18%. These findings underscore that while MPP in infants and toddlers often manifests with mild systemic symptoms, respiratory signs are pronounced, and the inflammatory response is generally moderate, leading to a high cure rate with timely and appropriate management. Early recognition of these age-specific characteristics is crucial for accurate diagnosis and effective treatment, thereby improving clinical outcomes in this vulnerable group.

## Disclosure statement

The author declares no conflict of interest.

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