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# Clinical Characteristics and Treatment Analysis of Chlamydia Psittaci Pneumonia Based on Multiple Targeted Amplification-High-Throughput Sequencing: A Single-Center Retrospective Study

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***Abstract:*** *To investigate the clinical manifestations, laboratory findings, imaging features, and treatment outcomes of patients with Chlamydia psittaci pneumonia, aiming to provide references for early clinical identification and precise treatment. A retrospective study was conducted, collecting clinical data from 13 patients diagnosed with Chlamydia psittaci pneumonia via multiple targeted amplification-high-throughput sequencingat the Second Affiliated Hospital of Guilin Medical University between June 2024 and January 2026. The analysis focused on patients' demographic characteristics (gender, age), clinical symptoms, laboratory test indicators (complete blood count, inflammatory markers, biochemical parameters, coagulation function, electrolytes), imaging findings, and antibiotic treatment regimens, while also evaluating adjustments in antibiotic use before and after diagnosis and patient prognosis. Among the 13 patients, 7 were male (53.8%) and 6 were female (46.2%), with an age range of 54 to 84 years and a mean age of 64 ± 8.8 years. All patients presented with fever (body temperature 39–41°C), with 11 (84.6%) accompanied by cough and sputum production, 6 (46.2%) by dizziness, and 5 (38.5%) by headache. Laboratory findings showed that all 13 patients (100%) had elevated C-reactive protein (CRP), decreased albumin, and elevated fibrinogen; 10 patients (76.9%) had decreased eosinophil percentage; 9 patients (69.2%) had elevated aspartate aminotransferase (AST); and 9 patients (69.2%) had hyponatremia. Chest CT primarily revealed large patchy exudation and consolidation in the lungs, with bilateral lung involvement in 7 cases, unilateral involvement in 6 cases, pleural effusion in 2 cases, and air bronchogram sign in 5 cases. Before etiological confirmation, all patients received empirical antibiotic therapy, primarily with β-lactam/β-lactamase inhibitor combinations or carbapenems (including piperacillin-tazobactam in 7 cases, cefoperazone-sulbactam in 3 cases, and meropenem in 2 cases). After diagnosis, 10 patients (76.9%) had their regimen adjusted to doxycycline (alone or in combination). All patients improved and were discharged, with no fatalities. Chlamydia psittaci pneumonia is more common in middle-aged and elderly populations, with high fever being the primary clinical feature. Fever is the main clinical manifestation. Characteristics of laboratory tests include elevated C-reactive protein (CRP) with little or no increase in procalcitonin(PCT), decrease in percentages of lymphocytes and eosinophils, hypoalbuminemia and increase in fibrinogen, and pulmonary consolidation shown by chest CT. The use of multiple targeted amplification-high-throughput sequencing technology enables rapid diagnosis and accuracy. Doxycycline can effectively treat this disease, and prognosis is overall good. In clinical practice, in patients with community-acquired pneumonia of unknown etiology, this disease must be suspected and etiological testing performed early, to guide precise treatment.*

***Keywords:*** *Chlamydia psittaci, Clinical characteristics, Multiple Targeted Amplification-High-Throughput Sequencing, Treatment*

## 1. Introduction

Chlamydia psittaci pneumonia, a zoonotic illness, is relatively rare in clinical practice. Differential diagnosis of community-acquired pneumonia is complicated by it physicians often have trouble. Symptoms such as high fever, headache, cough, etc. usually observed in regular bacterial or viral disease, often lead to misdiagnosis. A major risk factor for progression to severe disease is diagnosis

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that is delayed[1-2]. The classical etiological detection techniques lack timeliness and clinical feasibility which inhibits early and accurate detection of the disease. It also poses many challenges in understanding the epidemiological characteristics and implementing the prevention and control measures [3-4]. The development of molecular biology technology in recent years has made detection methods based on multiple targeted amplification-high-throughput sequencing change the clinical diagnostic paradigm for infectious diseases. These methods directly capture nucleic acids from clinical samples, overcoming the limitations of classical microbial culture, such as lengthy turnaround times and low detection rates, improving the chances of identifying difficult and rare pathogens[5-6]. The industry has recognized the utility of such testing for optimization of the diagnostic and treatment pathway for pulmonary infections[7-8]. Chlamydia psittaci pneumonia, however, has little evidence-based systematic research. Prior work primarily on a limited number of abnormal investigations, retrospective analyses of sporadic cases. Thus unable to establish a complete evidence chain covering laboratory characteristics, dynamic imaging evolution as well as clinical prognostic patterns[9-10]. As a result, advanced molecular diagnostic technique combined with detailed clinical data may complement Chlamydia psittaci pneumonia clinical characteristics, fill in the gaps in the current literature, and meet the needs of clinical practice on how to treat this disease effectively. In our study, we retrospectively analyzed a total of 13 cases of Chlamydia psittaci pneumonia confirmed by multiple targeted amplification-high-throughput sequencing. We reviewed patients' epidemiological exposure history, clinical manifestations, laboratory indicators, and dynamic imaging changes. Furthermore, we summarized the prognosis outcomes associated with different diagnosis and therapeutic interventions. We also outlined the typical clinical features of Chlamydia psittaci pneumonia. Finally, this was done to provide evidence-based support for clinicians in early identification and accurate diagnosis of such infections.

## 2. Materials and methods

### *2.1 Study subjects*

From June 2024, and January 2026, clinical data was collected from 13 patients with Chlamydia psittaci pneumonia by multiple targeted amplification-high-throughput sequencing at the Second Affiliated Hospital of Guilin Medical University. The information collected included patient's gender, age, history of avian contact, underlying disease, clinical manifestation, laboratory findings, imaging, treatment, prognosis.

### *2.2 Diagnostic criteria*

All cases were confirmed by detecting Chlamydia psittaci-specific nucleic acid sequences through multiple targeted amplification-high-throughput sequencing of bronchoalveolar lavage fluid samples.

### *2.3 Research methods*

A retrospective analysis was conducted. Collected data included: general patient information (age, gender, history of avian contact, underlying diseases); main clinical manifestations (fever, cough, sputum production, dizziness, headache, myalgia, sore throat); key laboratory test indicators (recorded on the day of admission: complete blood count, C-reactive protein (CRP), albumin, alanine aminotransferase (ALT), aspartate aminotransferase (AST), blood urea nitrogen (BUN), creatinine, lactate dehydrogenase (LDH), α-hydroxybutyrate dehydrogenase (α-HBDH), Activated Partial Thromboplastin Time (APTT), fibrinogen, electrolytes, D-dimer, procalcitonin (PCT), ferritin); imaging findings (all patients underwent chest CT before or on the day of admission, with emphasis on describing the distribution and morphology of lesions and the presence of features such as pleural effusion); treatment and prognosis (recording the types of antibiotics used during hospitalization and patient outcomes (death or survival)).

### *2.4 Statistical methods*

Data processing was performed using SPSS 25.0 statistical software. Categorical data were expressed as numbers (percentages). Normally distributed continuous data were described as mean ± standard deviation, while non-normally distributed continuous data were expressed as median (25th, 75th percentiles).

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## 3. Results

### *3.1 General information and clinical manifestations*

Among the 13 tested patients, 6 were female and 7 were male, with an age range of 54 to 84 years and a mean age of 64 ± 8.8 years. Two patients had a clear history of avian contact. All patients presented with fever (body temperature 39–41°C), with 11 (84.6%) accompanied by cough and sputum production, 6 (46.2%) by dizziness, and 5 (38.5%) by headache. Some patients had underlying conditions such as hypertension, thyroid nodules, cerebral infarction, gout, chronic obstructive pulmonary disease (COPD), and type 2 diabetes mellitus.(Table 1)

*Table 1: General Demographics and Clinical Manifestations of 13 Cases of Chlamydia psittaci Pneumonia*

| Characteristic | | Number of Cases | Percentage |
|---|---|---|---|
| Gender | Male | 7 | 53.8 |
| | Female | 6 | 46.2 |
| History of contact with poultry | Confirmed | 2 | 15.8 |
| | Unknown | 11 | 84.6 |
| Clinical manifestations | Fever | 13 | 100 |
| | Cough and Sputum Production | 11 | 84.6 |
| | Dizziness | 6 | 46.2 |
| | Headache | 5 | 38.4 |
| | Muscle pain | 1 | 7.69 |
| | Sore throat | 1 | 7.69 |
| Underlying medical conditions | Hypertension | 3 | 23.1 |
| | Kidney stones | 2 | 15.4 |
| | Thyroid nodules | 2 | 15.4 |
| | Cerebral infarction | 1 | 7.69 |
| | Gout | 1 | 7.69 |
| | COPD | 1 | 7.69 |
| | Type 2 diabetes | 1 | 7.69 |

### *3.2 Characteristics of laboratory data*

Complete Blood Count Characteristics: Among the 13 tested patients, 3 (23.1%) had elevated white blood cell(WBC); 8 (61.5%) had elevated neutrophil percentage; 6 (46.2%) had elevated neutrophil count; 10 (76.9%) had abnormal lymphocyte percentage (1 elevated, 9 decreased); 6 (46.2%) had abnormal lymphocyte count (1 elevated, 5 decreased). Eosinophil percentage was decreased in 10 patients (76.9%); eosinophil count showed no abnormalities; monocyte percentage was elevated in 4 patients (30.8%); monocyte count was elevated in 7 patients (53.8%); red blood cell count was decreased in 4 patients (30.8%); hemoglobin was decreased in 7 patients (53.8%); hematocrit was decreased in 8 patients (61.5%).

Inflammatory Marker Characteristics: Among the 13 tested patients, CRP was elevated in all (100%). Among the 8 tested patients, PCT and D-dimer were elevated in all (100%). Among the 5 tested patients, ferritin was elevated in all (100%).

Biochemical Parameter Characteristics: Among the 13 tested patients, albumin was decreased in all 13 (100%), AST was elevated in 9 (69.2%), ALT was elevated in 7 (53.8%), LDH was elevated in 8 (61.5%), andα-HBDH was elevated in 5 (38.5%); BUN and creatinine showed no abnormalities; hyponatremia was present in 9 patients (69.2%), hypokalemia in 7 (53.8%), and hypocalcemia in 7 (53.8%).

Coagulation Function Characteristics: Among the 13 tested patients, fibrinogen was elevated in all 13 (100%), and APTT was prolonged in 9 (69.2%). (Table 2)

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*Table 2: Laboratory test results of patients with Chlamydia psittaci pneumonia*

| Item | Number of Cases | Abnormal/Total (%) | Test Result (P25, P75)/ $\bar{x}\pm s$ |
|---|---|---|---|
| WBC($10^9$/L) | 13 | 3 (23.1) | 8.95 (6.47, 11.87) |
| neutrophil percentage(%) | 13 | 8 (61.5) | 73.3±12.9 |
| Lymphocyte Percentage(%) | 13 | 10 (76.9) | 13.2 (10.5, 22.35) |
| Eosinophil Percentage (%) | 13 | 10 (76.9) | 0.1 (0, 0.35) |
| Monocyte Percentage (%) | 13 | 4 (30.8) | 8.2±3.2 |
| Neutrophil Count($10^9$/L) | 13 | 6 (46.2) | 7.20±2.86 |
| Lymphocyte Count($10^9$/L) | 13 | 6 (46.2) | 1.35 (0.70, 1.82) |
| Eosinophil Count($10^9$/L) | 13 | 0 (0) | 0.01 (0, 0.04) |
| Monocyte Count ($10^9$/L) | 13 | 7 (53.8) | 0.82±0.48 |
| red blood cell ($10^{12}$/L) | 13 | 4 (30.8) | 4.29±0.42 |
| Hemoglobin(g/L) | 13 | 7 (53.8) | 121.08 ± 12.63 |
| Hematocrit(%) | 13 | 8 (61.5) | 36.42 ± 2.98 |
| CRP(mg/L) | 13 | 13 (100) | 102.535 ± 49.008 |
| Albumin(g/L) | 13 | 13 (100) | 34.2 (31.2, 35.4) |
| AST(U/L) | 13 | 9 (69.2) | 54.5 (19.9, 131.2) |
| ALT(U/L) | 13 | 7 (53.8) | 49.1 (19.7, 124.7) |
| BUN(mmol/L) | 13 | 0 (0) | 4.99±1.94 |
| Creatinine(μmol/L) | 13 | 0 (0) | 83±14 |
| LDH(U/L) | 13 | 8 (61.5) | 303±147 |
| α-HBDH(U/L) | 13 | 5 (38.5) | 187.8 ± 63.0 |
| Fibrinogen (g/L) | 13 | 13 (100) | 7.390 ± 1.683 |
| APTT (s) | 13 | 9 (69.2) | 43.59 ± 8.61 |
| Potassium (mmol/L) | 13 | 7 (53.8) | 3.63 ± 0.57 |
| Sodium (mmol/L) | 13 | 9 (69.2) | 136.0 (135.0, 137.0) |
| Calcium (mmol/L) | 13 | 7 (53.8) | 2.09±0.13 |
| D-dimer(μg/mL) | 8 | 8 (100) | 2.26 ± 1.46 |
| PCT(ng/mL) | 8 | 8 (100) | 0.434(0.133,2.228) |
| Ferritin(ng/mL) | 5 | 5 (100) | 1005.24±578.24 |

### *3.3 Characteristics of imaging data*

Chest CT primarily revealed large patchy exudation and consolidation in the lungs, with bilateral lung involvement in 7 cases, unilateral involvement in 6 cases, pleural effusion in 2 cases, and air bronchogram sign in 5 cases.

### *3.4 Treatment and outcomes*

Before diagnosis, all patients received empirical antibiotic therapy. The main regimens included: piperacillin-tazobactam in 7 cases, cefoperazone-sulbactam in 3 cases, meropenem in 2 cases, amoxicillin-clavulanate in 1 case, and combination therapy in 2 cases (1 case of piperacillin-tazobactam + moxifloxacin, and 1 case of piperacillin-tazobactam + levofloxacin). After diagnosis, antibiotic regimens were adjusted for targeted treatment, with the main changes as follows: the original regimen was maintained in 2 cases (1 case of piperacillin-tazobactam, 1 case of piperacillin-tazobactam + levofloxacin); the original regimen was combined with doxycycline in 6 cases; switched to doxycycline monotherapy in 2 cases; switched to quinolone-based therapy with or without doxycycline in 2 cases (1 case of levofloxacin combined with doxycycline, 1 case of moxifloxacin monotherapy); switched to a β-lactamase inhibitor combination + doxycycline in 1 case. Following the above treatments, all patients improved and were discharged, with no fatalities. (Table 3)

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*Table 3 Treatment and Outcomes of 13 Patients*

| Patient | Age | Gender | Sequence Number | Antibiotics Before Diagnosis | Antibiotics After Diagnosis |
|---|---|---|---|---|---|
| 1 | 70 | Female | 43 | piperacillin-tazobactam | piperacillin-tazobactam |
| 2 | 60 | Male | 2901 | piperacillin-tazobactam moxifloxacin | Levofloxacin doxycycline |
| 3 | 62 | Female | 13 | cefoperazone-sulbactam | cefoperazone-sulbactam doxycycline |
| 4 | 54 | Male | 44132 | piperacillin-tazobactam | piperacillin-tazobactam doxycycline |
| 5 | 55 | Male | 6217 | meropenem | doxycycline |
| 6 | 56 | Female | 4736 | piperacillin-tazobactam | doxycycline |
| 7 | 84 | Male | 33974 | meropenem | piperacillin-tazobactam doxycycline |
| 8 | 58 | Female | 43411 | cefoperazone-sulbactam | cefoperazone-sulbactam doxycycline |
| 9 | 67 | Male | 9142 | piperacillin-tazobactam levofloxacin | piperacillin-tazobactam levofloxacin |
| 10 | 69 | Female | 133 | cefoperazone-sulbactam | cefoperazone-sulbactam doxycycline |
| 11 | 72 | Female | 1801 | amoxicillin-clavulanate | amoxicillin-clavulanate doxycycline |
| 12 | 56 | Male | 1234 | piperacillin-tazobactam | moxifloxacin |
| 13 | 70 | Male | 2296 | piperacillin-tazobactam | piperacillin-tazobactam doxycycline |

## 4. Discussion

Chlamydia psittaci is a commonly zoonotic atypical pathogen involved in community-acquired pneumonia. Infectious diseases caused by such a pathological agent do not have specific clinical manifestations. Their symptoms' composition is complex, making them easily misdiagnosed during differential diagnoses, and cause a delay in treatments. Traditional detection approaches often suffer from limitations in sensitivity, lengthy detection durations, and operational complications. Due to their uncommon inclusion in standard clinical screenings, the chance of these items being missed is high. Pneumonia can developed quickly in the course of such diseases. Early identification and accurate etiological diagnosis will ensure an optimal prognosis. The study of more sensitive detection methods and the patterns of clinical development of the disease is of academic significance and practical application value for fostering early disease recognition and standardising diagnosis and treatment. Earlier studies often face situations like small sample size, and usage of a single detection method. Using a multiplex targeted amplification-high-throughput sequencing technology, a highly reliable diagnostic framework is established. It comprehensively tracks detailed clinical records, organizes associated phenotypes, analyzes the distribution pattern of susceptible middle-aged and elderly populations, compiles key biochemical indicators of the population, and evaluates the practical benefits of imaging feature intervention strategies in clinical applications, thus accumulating evidence-based support for the standardization of the diagnosis and treatment of Chlamydia psittaci pneumonia. The next sections discuss relevant empirical findings.

In terms of the epidemiological characteristics of this study, data was observed from 13 cases, of male and female 53.8 and 46.2% respectively. The subjects ranged in age from 54 to 84 years. The characteristics of the sample are not statistically different from prior studies. Chlamydia psittaci pneumonia typically occurs at an average age of 59 years, according to literature, and most cases involve males[11]. The information gathered in the study supports this conclusion. The clustering of cases in this age group results from the deterioration of immune surveillance function, the burden of multiple pre-existing diseases, and greater exposure opportunities to the pathogen. As per some studies[12], the age range of onset could be from 20 to 90 years. But still, world health organization states that middle-aged and elderly can still be the group with the most probability of disease. Based on this mode of work, in clinical practice, when encountering suspected cases of elderly and middle-aged patients, this disease can be regarded as an important direction in differential diagnosis. Birds are the natural reservoir hosts for Chlamydia psittaci and pose a major source of infection to public health[13].

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Most pathogens will spread through respiratory secretions carrying the pathogen or aerosols from dried faecal debris. According to literature datat[11], only 33.3% of affected persons gave a clear helios of avian contact as source of infection. The rest conceals the exposure route[11]. The study data reveal that contact history with birds was evident in 15.4 % cases while the residual 84.6 % could not pinpoint the direct exposure link. This feature is in line with distribution trends recente epidemiological ones. There are three reasons for the difficulty in tracing sources: first, widespread environmental exposure; second, Chlamydia psittaci spreads via the respiratory route; and third, indirect contact by patients in places like farmers' markets or urban parks that go unrecorded in diagnosis. The second aspect is about interference with the collection of information; in fact, the disease course of 5 to 14 days may increase recall biases like the subtle processes of contact that are more the subject of imagination. Third, there are many host species capable of carrying the pathogen. In addition, poultry and pigeons which are non-ornamental birds are also significant reservoir hosts. Environmental source exposure is a new focus of disease prevention and control. For pneumonia cases of unknown etiology, it's necessary to investigate epidemiological investigation information in-depth, strengthen capabilities of early identification, and block community transmission.

Based on the clinical picture of this group of patients, they all developed persistent high fever of 39 to 41 oC. This occurrence is in accordance with prior reports on Chlamydia psittaci pneumonia[14]. In this case mix, the proportion of cough and neurological symptoms were quite high. The clinical diagnosis and treatment of these symptoms are not pathologically specific and may easily be confused with influenza or Mycoplasma pneumoniae pneumonia. Myalgia and sore throat incidence was 7.69%, and both symptoms have low diagnostic reference value. When doctor in the clinic treat the medical middle-aged and old age patient with community-acquired pneumonia when presenting the explosive high fever and upper respiratory catarrhal symptoms not apparent, doctors can review the patient epidemiological history, and take Chlamydia psittaci infection as a key differential diagnosis direction.

After organizing laboratory inflammatory indicator data collected from the study patients, only 3 predicted cases among the 13 cases followed in the current study showed abnormal white blood cell count. The CRP test results of all cases were found to be abnormal. Most patients that were sent for PCT and ferritin testing had high PCT and ferritin. The changes in these indicators imply that Chlamydia psittaci may cause a serious systemic inflammatory reaction when it enters the human body. The disease agent undergoes a specific biphasic life cycle to cause the disease. Following the entry of the elementary body into the cell, it differentiates into a reticulate body, proliferates in the inclusion body, cell rupture, and inflammatory reactions[15]. This infection pattern stimulates the monocyte-macrophage system causing the release of inflammatory mediators like cytokine storm[16]. The simultaneous rise of CRP, PCT and ferritin produced by this process is also seen in public reports published earlier. According to the literature, the increase of CRP is a specific manifestation of this pneumonia[17]. Also, the disease is positively correlated with the indicator level[17]. A higher level of CRP & ferritin, than an ordinary case, is seen in severe patients[18]. In clinical practice, for patients who present with the elevation of these three inflammatory indicators simultaneously, the early warning should be enhanced to detect a tendency of severe disease early and enable timely transfer to intensive care unit intervention.

After organizing laboratory complete blood count indicator data, most patients in this group simultaneously exhibited decreased lymphocyte percentage and decreased eosinophil percentage, which can be termed the "double decrease" phenomenon. Lymphocyte depletion is related to two factors: on one hand, direct apoptosis induced by the pathogen, and negative regulation of T-cell proliferation by the inflammatory environment; on the other hand, corticosteroid-mediated chemotactic redistribution under stress conditions also affects lymphocyte count[19]. A decrease in eosinophil count suggests a shift in the body's immune response towards Th1 type, inhibiting the cell differentiation process driven by Th2 factors[2]. In patients with ordinary bacterial pneumonia, eosinophil test results are mostly within the normal range, and some patients may show compensatory elevation. The hematological characteristics observed in this patient group are relatively specific and hold high value for the differential diagnosis of Chlamydia psittaci pneumonia. This study is a single-center retrospective design with a limited sample size and did not perform multidimensional stratified analysis. The conclusions drawn here can provide biological clues for subsequent establishment of prognostic models based on multicenter large samples and for accurately distinguishing infections by different pathogens.

After organizing laboratory biochemical indicator data from the study patients, this study observed that all subjects had varying degrees of decreased albumin levels accompanied by electrolyte disturbances. Statistical results showed that 69.2% of study patients developed hyponatremia, 53.8%

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developed hypokalemia, and another 53.8% developed hypocalcemia. The decrease in albumin content is related, on one hand, to the body maintaining a high catabolic state during high fever, and on the other hand, to insufficient protein intake, inhibited liver synthetic function, and protein loss due to capillary leakage[20]. The pathological mechanism of hyponatremia is closely associated with Chlamydia psittaci-induced syndrome of inappropriate antidiuretic hormone secretion(SIADH). Chlamydia psittaci acts on the hypothalamic-pituitary axis, mediating water retention and leading to hemodilution. This process is compounded by insensible water loss during high fever and potential effects on adrenal cortical function. Hypokalemia and hypocalcemia are mostly related to insufficient intake, gastrointestinal loss, and inflammation factor-mediated ion shift into cells. In clinical observation, hyponatremia can cause cerebral edema. Some patients in this group exhibited consciousness disturbances such as dizziness and headache. Elevated LDH and α-HBDH indicators suggest a risk of myocardial damage in patients. Electrolyte imbalance can exacerbate myocardial injury. Clinical management can refer to the following: daily close dynamic monitoring of neurological signs; patients with blood sodium below 130 mmol/L need fluid restriction; rapid sodium correction can induce osmotic demyelination, requiring preventive measures; timely supplementation of potassium and calcium; when using drugs like quinolones that can prolong the QT interval, a comprehensive risk assessment is necessary.

After organizing laboratory coagulation indicator data from the study patients, this group included a total of 13 observation samples. All showed abnormalities in fibrinogen and APTT. Eight tested subjects had D-dimer test results above the reference range, confirming that Chlamydia psittaci can significantly activate the host coagulation cascade. Pathophysiological studies have relevant records[20]. This pathogen acts through three pathways: the inflammatory cascade stimulates the liver to synthesize acute-phase proteins; vascular endothelial damage activates the extrinsic coagulation pathway; and the release of tissue factor from monocyte surfaces exceeds the normal range. The experimental data obtained in this group can corroborate the viewpoint proposed in literature[1] that "the degree of coagulation abnormality reflects pneumonia severity." In the process of clinical diagnosis and treatment, it is necessary to continuously follow the changes of patient's coagulation indicators to early block disseminated intravascular coagulation (DIC) risk.

After collecting laboratory liver enzyme and muscle enzyme indicator data from the study patients, elevated AST and elevated ALT levels raised the suspicion of liver injury. Among the 13 patients in this group, AST was elevated in 9 cases. While ALT was elevated in 7 patients. Chlamydia psittaci capable of invading human liver according to study. As it enters the body, the pathogen multiplies first in the monocyte-macrophage system and then spreads throughout the body via the bloodstream, directly damaging hepatocyte[20]. An increase in the percentage of monocytes was observed in this study. It supports that the activated state of the monocyte–macrophage system will confirm the pathogenic hepatotropic nature. The information within this collection of objects is in agreement with the literature[21] that reports an 83.3% liver function abnormality rate, with hepatocellular damage being the most commonly encountered phenotype. Among these, 8 patients had elevated LDH and 5 patients had elevated α-HBDH indicating myocardial damage. The process involved in myocardial injury is of two types: one is the direct invasion of myocardium by the pathogen, which changes membrane permeability, reduces intracellular ATP, and LDH release into blood[10]. The other is the pathogen causes the body's auto-immune response that infiltrating immune cells and antibody action cause secondary damage[22-24]. Previous studies have shown that LDH and CK are the main laboratory parameters being used for assessment of progression towards severe disease[25]. When the gastrointestinal or cardiovascular systems of patients afflicted with fever and respiratory-related symptoms are involved, clinicians must first rule out this disease and arrange for multiplex targeted amplification-high-throughput sequencing testing to avoid missed diagnosis. Further large-sample cohort studies in multiple centres could create prediction models which can explore the molecular mechanisms of liver and myocardial injury, and could explore directions for protecting liver and myocardium focusing on apoptosis and autophagy pathway.

Observing imaging characteristics, it can be found that chest CT scans of this case group mostly showed extensive exudation accompanied by consolidative opacities. Lesions may involve either one lung field or both. Once in the lungs, the pathogen can cause severe inflammation and cell infiltration. The diagnosis of Chlamydia psittaci infection is more consistent with patchy consolidation signs. This is in the absence of Mycoplasma pneumoniae and Legionella pneumonia. Such manifestations are probably more likely to occur due to the pathogen resulting in local hyperimmune responses that damage the alveolar walls [1-2]. The presence of air bronchograms may accompany the consolidation shadows. Air bronchograms is defined as the condition in which the presence of gas in the alveoli is not completely occupied by exudate, which also comports with the development pattern of pneumonia

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caused by atypical pathogens[2]. The low chance of pleural effusion signifies certain spatial restrictions in the spread of this inflammatory response. These imaging patterns can be essential references for clinical differential diagnosis. When clinically encountering patients with high fever and CT findings in line with the characteristics above, clinicians can review the history of avian contact of the patients in detail and use multiplex targeted amplification-high–throughput sequencing technology in a timely manner to clarify the etiological diagnosis.

In this study, the commonest scheme used was doxycycline, either alone or in combination with quinolones or β-lactams, being chosen in 76.9% of cases in the practice of this group. In the end, all patients were reported with a good prognosis without mortality. Regarding pharmacological mechanisms, chlamydiae are intracellular parasitic pathogens without a cell wall and have natural resistance to conventional β-lactam antibiotics that interfere with cell wall synthesis [9]. Doxycycline inhibits pathogen protein synthesis, making it a first-line treatment choice[3][10]. Quinolones demonstrate reliable anti-chlamydial activity in clinical applications and are often combined with other drugs for severe cases[26]. Newer drugs like tigecycline and omadacycline can exert therapeutic effects, expanding the available clinical treatment paths for this disease[27]. Existing clinical data show that quinolone preparations like levofloxacin and moxifloxacin are effective against various clinical conditions. These drugs have become high-frequency clinical choices. On one hand, stable drug supply is available in the domestic pharmaceutical distribution sector; more deeply, during long-term clinical practice, physician groups have gradually formed stable medication selection habits and tend to prioritize these drugs when following fixed diagnosis and treatment pathways.

This study found that the clinical efficacy of multiplex targeted amplification-high-throughput sequencing for detecting Chlamydia psittaci is superior to culture and serological detection. This technology directly achieves high-throughput capture of nucleic acids from clinical samples, avoiding lengthy culture cycles, enhancing detection sensitivity and specificity, and shortening diagnosis time[28-29]. Relative to metagenomic sequencing, multiplex targeted amplification-high-throughput sequencing maintains a good pathogen detection range, but not high detection costs and waiting times[30]. After empirical medication did not work out as expected in this patient population, multiplex targeted amplification-high-throughput sequencing diagnosis was performed on them. In 84.6% of cases, there were deviations to more precise treatment plans, which demonstrates the technology's key value. For patients with pneumonia who have ineffective empirical anti-infective therapy and fever, bronchoalveolar lavage fluid can be given priority for multiplex targeted amplification-high-throughput sequencing screening. Create a system to link diagnosis with treatments quickly enough to allow adjustment of the treatment plan within 6 hours of a report being available. Organize interdisciplinary consultations involving experts. Aim for individualized diagnosis and treatment plans. Involve experts in respiratory, infectious diseases, microbiology and pharmacy and others. Improve standardization from specimen transport to result interpretation. Insta0ll quality control standards of full-process quality.

This study has a few limitations. To start with, it had a single-center retrospective design, thus limiting the number of samples. The study might have had a selection bias that affect the applicability of its conclusions. One should interpret the findings with extreme caution. Secondly, data for certain inflammation-related indicators and certain coagulation-related indicators was missing which precluded the full presentation of patient indicators biochemical characteristics distribution patterns. Third, since this study did not set up a control group that did not have chlamydia pneumonia, therefore, it is not known whether multivariate regression analysis could prove independent predictive effect of chlamydia psittaci pneumonia.

Overall, older individuals are the more susceptible populations with Chlamydia psittaci pneumonia. The disease frequently displays clinical manifestations, biochemical indicators and imaging features that are nonspecific. When clinically managing community-acquired pneumonia, if patients present with persistent high fever and with the "indicator dissociation" of CRP and PCT, as well as low percentage of lymphocytes, low percentage of eosinophils, low albumin, and high fibrinogen, consider Chlamydia psittaci pneumonia as the top consideration. Multiplex targeted amplification-high-throughput sequencing allows for early definitive diagnosis. Prognosis generally meets expectations as combined with doxycycline treatment. To optimize the operational efficiency of healthcare, it is vital for frontline doctors to effectively identify the characteristics of the disease and standardise the use of multiplex targeted amplification-high-throughput sequencing test. Follow-up multicenter large-sample studies will further validate these conclusions, assess the clinical application value of new-generation drugs such as omadacycline and tigecycline, promote vaccine development for susceptible populations, and strengthen the overall control model for Chlamydia psittaci pneumonia.

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**References**

*[1] Chen J, Sun Y, Luo J, et al. V-V ECMO for severe Chlamydia psittaci pneumonia presenting with sudden cardiac arrest: A case report and literature review. Medicine (Baltimore). 2024 Nov 8;103(45):e39808. doi:10.1097/MD.0000000000039808.*

*[2] Shi Y, Chen J, Shi X, et al. A case of chlamydia psittaci caused severe pneumonia and meningitis diagnosed by metagenome next-generation sequencing and clinical analysis: a case report and literature review. BMC Infect Dis. 2021 Jun 30;21(1):621. doi:10.1186/s12879- 021-06205-5.*

*[3] Sun X, Jiao Q, Fu X, et al. Case Report: Severe psittacosis in an elderly patient without avian exposure: diagnosis via metagenomic next-generation sequencing and rapid response to doxycycline. Front Med (Lausanne). 2025 Dec 18:12:1689333. doi:10.3389/fmed.2025.1689333.*

*[4] Li N, Li S, Tan W, Wang H, Xu H, Wang D. Metagenomic next-generation sequencing in the family outbreak of psittacosis: the first reported family outbreak of psittacosis in China under COVID-19. Emerg Microbes Infect. 2021 Dec;10(1):1418-1428. doi:10.1080/22221751.2021.1948358.*

*[5] Chen Q, Yi J, Liu Y, et al. Clinical diagnostic value of targeted next-generation sequencing for infectious diseases (Review). Mol Med Rep. 2024 Sep;30(3):153. doi:10.3892/mmr.2024.13277.*

*[6] Society of Clinical Microbiology of China International Exchange and Promotion Association for Medical and Healthcare. Expert consensus on the application and practice of targeted next-generation sequencing in infectious diseases. National Medical Journal of China. 2024;104(48):4375-4383. doi:10.3760/cma.j.cn112137- 20240927-02208.*

*[7] Yang Z, Liu Q, Hu Y, Geng S, Ni JX. Application of Metagenomic and Targeted Next-Generation Sequencing in Diagnosis of Pulmonary Tuberculosis in Bronchoalveolar Lavage Fluid. Infect Drug Resist. 2025 May 3:18:2229-2241. doi:10.2147/IDR.S514090.*

*[8] Ding Y, Jing C, Wei J, et al. Comparison of the diagnostic capabilities of tNGS and mNGS for pathogens causing lower respiratory tract infections: a prospective observational study. Front Cell Infect Microbiol. 2025 Jun 10:15:1578939. doi:10.3389/fcimb.2025.1578939.*

*[9] Xu P, Huang Z. Omadacycline treatment of severe Chlamydia psittaci pneumonia with septic shock diagnosed via metagenomic next-generation sequencing. J Infect Dev Ctries. 2025 Oct 31;19(10):1570-1576. doi:10.3855/jidc.21299.*

*[10] Zhang Z, Zhou H, Cao H, et al. Human-to-human transmission of Chlamydia psittaci in China, 2020: an epidemiological and aetiological investigation. Lancet Microbe. 2022 Jul;3(7):e512-e520. doi:10.1016/S2666-5247(22)00064-7.*

*[11] Wang P, Tian B, Tian C, Shan C, Huang R, Zhang Q. Clinical characteristics and prognosis of patients with Chlamydia psittaci pneumonia identified by metagenomic next-generation sequencing. BMC Infect Dis. 2026 Feb 12;26(1):583. doi:10.1186/s12879-026-12822-9.*

*[12] Fang C, Zhang Y, Zhang A, et al. Clinical Features of 186 cases of Chlamydia psittaci Pneumonia: A Multicenter Study[J]. Infect Drug Resist. 2026 Jan 9:19:563892. doi: 10.2147/IDR.S563892.*

*[13] Ni Baoping, Xie Jingling. Two Cases of Chlamydophila psittaci Pneumonia Complicated by Acute Hemolytic Anemia [J]. Medical Theory and Practice, 2025, 38(7): 1181–1183.*

*[14] Clinical Microbiology Laboratory Specialized Committee of the Chinese Hospital Association; Infectious Diseases Working Group of the Laboratory Medicine Branch of the Chinese Geriatrics Society. Chinese Expert Consensus on the Diagnosis and Treatment of Psittacosis [J]. Chinese Journal of Clinical Infectious Diseases, 2024, 17(3): 191-204. doi: 10.3760/cma.j.issn.1674-2397.2024.03. 002.*

*[15] Xiao J, He J, He Z, et al. Chlamydia psittaci hypothetical inclusion membrane protein CPSIT_0842 evokes a pro-inflammatory response in monocytes via TLR2/TLR4 signaling pathways. Vet Microbiol. 2023 May:280:109693. doi:10.1016/j.vetmic.2023.109693.*

*[16] He S, Wang C, Huang Y, et al. Chlamydia psittaci plasmid-encoded CPSIT_P7 induces macrophage polarization to enhance the antibacterial response through TLR4-mediated MAPK and NF-κB pathways. Biochim Biophys Acta Mol Cell Res. 2022 Oct;1869(10):119324. doi:10.1016/j.bbamcr. 2022.119324.*

*[17] Huang M, Wang Y, Lu Y, et al. Clinical Characteristics and Predicting Disease Severity in Chlamydia psittaci Infection Based on Metagenomic Next-Generation Sequencing. Infect Drug Resist. 2025 Feb 26:18:1171-1181. doi:10.2147/IDR.S509879.*

*[18] Wu Y, Xu X, Liu Y, et al. Case Report: Clinical analysis of a cluster outbreak of chlamydia psittaci pneumonia. Front Cell Infect Microbiol. 2023 Aug 10:13:1214297. doi:10.3389/fcimb.2023. 1214297.*

*[19] Ambwani S, Dolma R, Sharma R, et al. Modulation of inflammatory and oxidative stress biomarkers due to dexamethasone exposure in chicken splenocytes. Vet Immunol Immunopathol. 2023 Aug:262:110632. doi:10.1016/j.vetimm.2023.110632.*

*[20] Wang Jianzhi, Yin Lianhua, Chen Xiaoshu, et al. Pathophysiology [M]. 10th ed. Beijing: People's Medical Publishing House, 2023.*

ISSN 2616-5791 Vol. 7, Issue 2: 56-65, DOI: 10.25236/AJMHS.2026.070208

*[21] Fang C, Xu L, Lu J, Li Y, Zhao Z. Liver Function Abnormalities in Patients with Chlamydia psittaci Pneumonia: A Multicenter Retrospective Study. Infect Drug Resist. 2025 Jun 28:18:3207-3217. doi:10.2147/IDR.S535247.*

*[22] Huang Y, Li S, He S, Li Y, He Q, Wu Y. Chlamydia psittaci inclusion membrane protein CPSIT_0842 induces macrophage apoptosis through MAPK/ERK-mediated autophagy. Int J Biochem Cell Biol. 2023 Apr:157:106376.2023 Apr. doi:10.1016/j.biocel.2023.106376.*

*[23] Xu L, Liang M, Chen Z, et al. Design a multi-epitope vaccine targeting Chlamydia psittaci plasmid proteins through reverse vaccinology. Int J Biol Macromol. 2026 Mar:350:150954. doi:10.1016/ j.ijbiomac.2026.150954.*

*[24] Li Q, Li X, Quan H, et al. IL-10-/- Enhances DCs Immunity Against Chlamydia psittaci Infection via OX40L/NLRP3 and IDO/Treg Pathways. Front Immunol. 2021 May 21:12:645653. doi:10.3389/fimmu.2021.645653.*

*[25] Yuan L, Chen Q, Zhu XY, Lai LM, Zhao R, Liu Y. Evaluation of clinical characteristics and risk factors associated with Chlamydia psittaci infection based on metagenomic next-generation sequencing. BMC Microbiol. 2024 Mar 13;24(1):86. doi:10.1186/s12866-024-03236-1.*

*[26] Zhou Yan, Zou Ya, Lu Yun, et al. Clinical Characteristics and Treatment Analysis of 24 Cases of Chlamydia psittaci Pneumonia in Sichuan Province [J]. Central and South Pharmaceutical Sciences, 2024, 22(3):778-783.*

*[27] Song Y, Feng R, Sun L, et al. Clinical characterization of Chlamydia psittaci infections detected by targeted next generation sequencing in a Chinese tertiary hospital. Front Med (Lausanne). 2026 Jan 26:13:1744125. doi:10.3389/fmed.2026.1744125.*

*[28] Liu J, Yang B, Wu Y, Yang G, Zha X, Jiang W. Significance of Combining Bronchoalveolar Lavage Fluid With Targeted Next-Generation Sequencing in the Pathogen Detection-Based Diagnosis of Pulmonary Infections. Clin Respir J. 2025;19(1):e70046. doi:10.1111/crj.70046.*

*[29] Liang A, Wu X, Zhu Y, et al. Targeted next-generation sequencing (tNGS): An upcoming application for pathogen identification in clinical diagnosis. J Infect Public Health. 2025;18(10): 102936. doi:10.1016/j.jiph.2025.102936.*

*[30] Kuang Y, Tan W, Hu C, et al. Diagnosis value of targeted and metagenomic sequencing in respiratory tract infection. Front Cell Infect Microbiol. 2024 Dec 12:14:1498512. doi:10.3389/fcimb.2024.1498512.*