

# Nursing Care of a Patient With Severe Pneumonia Caused by *Chlamydia psittaci*

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## ABSTRACT

**Background:** Parrot fever is a zoonotic bacterial infectious disease caused by *chlamydia psittaci*. It is often caused by direct or indirect contact with infected poultry. Human infection usually manifests as pneumonia, which is rare in clinical practice. We reported a patient with severe pneumonia caused by parrot fever and described her treatment and care to promote recovery.

**Methods:** To report the nursing experience of a patient with severe pneumonia caused by *chlamydia psittaci* during the COVID-19 pandemic.

**Results:** During the COVID-19 pandemic, patients with similar symptoms to COVID-19 were subjected to rigorous screening and differential diagnosis. We used metagenomic sequencing to detect Chlamydia parrot and diagnosed pneumonia caused by Chlamydia parrot infection. We provided airway management, oxygen therapy, enhanced nutrition and skin integrity management, and prevention of infection based on the patient's specific circumstances. At the same time, due to the strict

management policy of COVID-19, the patient could not be accompanied by his family in the emergency intensive care unit. Therefore, we also paid attention to the psychological situation of the patient and provided psychological care.

**Conclusion:** This case with severe pneumonia caused by parrot fever should pay attention to airway management. Based on doing an excellent job of basic nursing, psychological nursing for this case lacking accompaniment should be strengthened to promote the rehabilitation of this case.

**Keywords:** *Chlamydia psittaci*, Pneumonia, Nursing.

## I. INTRODUCTION

Parrot fever is a zoonotic bacterial infectious disease caused by *Chlamydia psittaci* [1]. *Chlamydia psittaci* is an aerobic gram-negative pathogen, which is strictly intracellular parasites [2]. It is infected by direct contact with infected birds or inhalation of aerosols in bacterial secretions, excrement, feathers, and dust [3]. The lung is the most common infection site[4] and the most common symptoms are fever, chills, headache, dry cough, etc. [3,5]. Pneumonia caused by *Chlamydia psittaci* is usually mild, but some these cases can develop into serious diseases. Relevant data showed that 8% of these cases infected with *Chlamydia* parrot would turn into severe pneumonia [6]. However, due to the poor sensitivity and specificity of the current routine examination and diagnostic tests, it is difficult to accurately detect parrot fever infection, which is easily ignored [4]. For this case, rapid recovery depends on accurate diagnosis and timely treatment. In September 2021, a patient with severe *Chlamydia* parrot pneumonia diagnosed by second-generation sequencing of pathogens was admitted to the intensive care unit in Nantong City, Jiangsu Province, China. During the treatment, respiratory failure, myocardial injury, and other MODS occurred, which brought great challenges to the nursing work of nurses in our intensive care unit. But with the joint efforts of medical staff, the patient's condition stabilized after 15 days in the intensive care unit

## II. CLINICAL DATA

### General Information

On 6 September 2021, a 58-year-old female patient diagnosed with 'severe pneumonia' due to 'cough and expectoration with fever for one week and shortness of breath for two days ' was pushed into the hospital by flatcar at 22: 45. On admission, she was conscious but weary. The vital signs were body temperature: 38.5°C, heart rate: 80 times/min, breathing: 33 times/min, blood pressure: 123/80mmHg. Chest CT showed diffuse fluffy shadows of both lungs, and a small amount of pleural effusion on the left side and transferred to our hospital for emergency treatment. She had a history of high blood pressure, diabetes, and a long personal career in sofa fabric production.

### Treatment Procedure

After admission, ECG monitoring was performed. When oxygen inhalation could not maintain the pulse oxygen saturation, it was changed to non-invasive ventilator-assisted respiration. After that, it was altered to endotracheal intubation and ventilator-assisted respiration. Blood samples were collected, and the positive results were: white blood cell count  $15 \times 10^9/L$ , medium cell classification 87.5 %; c-reactive protein was 262.4 mg/L; blood gas analysis showed PH 7.475, PaO<sub>2</sub>244.11mmHg, PaCO<sub>2</sub>33.63mmHg; troponin I 0.148ug/L; fibrinogen degradation product 52.3ug/ml; antithrombin III 61.9%; aspartic acid aminotransferase 114u/L, alanine aminotransferase 46u/L (TABLE 1). So, we gave anti-infection, antiasthmatic phlegm,

nutritional support, and other treatment. Tracheoscopy was performed on the third day of admission, and the bronchoalveolar lavage fluid was obtained for pathogen sequencing. The bronchoscopy results showed that the main bronchus and branches of each bronchus were unobstructed, no new organisms and foreign bodies were found, and a small number of tracheal secretions were seen. Gene sequencing results showed *Chlamydia psittaci*. On the 7th day after admission, the indicators were significantly improved, and medication was adjusted. On the eighth day of admission, due to renal insufficiency, we underwent bedside continuous renal replacement therapy, and weaning on the same day. On the 11th day after admission, the blood test indexes tended to be expected, and the body temperature returned to normal. The chest CT examination showed that the pulmonary albinism area was reduced, and the inflammation in both lungs was significantly absorbed. The SBT offline test was carried out, the tracheal intubation was removed, and the ventilator was removed. When the oxygen was inhaled at 5 L/min, the oxygenation was satisfactory, the anti-inflammatory and nutritional support was continued, and the respiratory function exercise was performed simultaneously. After 15 days of admission, the patient's condition stabilized, and she waited for the bed to be transferred to the general ward.

**Table 1: General information of this case.**

Variable	Specific information
Sex	Female
Age	58 years old
Chief complaint	Cough, expectoration, fever for 1 week, shortness of breath for 2 days
Admission time	22: 45 on September 6, 2021
Past medical history	Hypertension, diabetes
Diagnosis	Severe pneumonia caused by chlamydia psittaci
Vital sign	T:38.5°C, P:80 times/min, R : 33times/min, BP:123/80mmHg
Blood routine	White blood cell count $15 \times 10^9/L$ , medium cell classification 87.5 %
C-reactive protein	262.4mg/L
Blood gas analysis	PH:7.475, PaO <sub>2</sub> :44.11mmHg, PaCO <sub>2</sub> :33.63mmHg
Chest CT	Diffuse flocculent film of two lungs, a small amount of pleural effusion on the left side
Bronchoscope	The main bronchus and branches of each bronchus were basically unobstructed, no new organisms and foreign bodies were found, and a small amount of tracheal secretions were seen
Metagenomic sequencing	<i>Chlamydia psittaci</i>

**T: Body temperature; P: Pulse, R: Respiratory rate, BP: Blood Pressure**

### III. CARE

#### Lowering Body Temperature

The patient's body temperature has been very high, up to 39.0°C, so we took timely cooling and anti-infective treatment. We used an ice blanket machine to cool the patient. The water temperature of the ice blanket machine was set to 10-15°C, and the body temperature was set to 36-37°C. Tigecycline combined with azithromycin anti-infection and oseltamivir antiviral therapy were used by us [7]. Meantime we performed continuous ECG monitoring on the patient and closely observed the changes in her body temperature, heart rate, respiration, blood pressure, and pulse oxygen saturation, which were recorded once an hour [8]. After the use of anti-infective and antiviral therapy drugs, we observed whether the patient's body temperature, blood routine, inflammatory indicators were better than before, and drug metabolism through the liver and kidney [9]. At the same time, paying attention to the monitoring of liver and kidney function test indicators, and according to the doctor's requirements careful use of liver/kidney protection drugs to avoid further damage to liver and kidney function [10]. We observed the blood routine, blood gas analysis, coagulation, liver and kidney function, chest imaging, and pathogen detection results of the patient

every day [11]. Because the patient has diabetes, we used insulin, and every 2 hours tested the patient's blood sugar changes to make adjustments. After treatment, the patient's body temperature returned to average level. The results showed that the inflammatory indexes were also improved, which proved that our cooling measures were effective.

## **Paying Attention to the Nursing of Respiratory Failure**

**Strengthening nursing of mechanical ventilation:** The patient was given noninvasive ventilation shortly after admission [12]. On the second day of admission, we intubated the patient and connected the ventilator with invasive positive pressure ventilation. Ventilation mode was VC-SIMV, FiO<sub>2</sub> 60 %, PEEP 15cmH<sub>2</sub>O. In the process of mechanical ventilation, to prevent airway injury, we used midazolam and remifentanyl for sedation and analgesia, and used RASS (Richmond agitation-sedation scale) and CPOT (Critical Care Pain Observation Tool) every four hours to evaluate the sedation and analgesia of patients [13]. The RASS score of the patient was between -1 and 3, indicating mild to moderate sedation with CPOT was 0. When the patient's oxygenation index was  $\leq 200$ mmHg, the nurse assisted the doctor in completing the prone position ventilation [14,15]. First, we removed the secretions in the respiratory tract of this case, stopped enteral nutrition. Then, we increased the dose of sedative and analgesic drugs to determine the direction of turning over. Finally, all the tubes were moved to the turning side. We used five people to help turn around and resumed supine position after 8 hours.

We used the suction tube to penetrate the airway of the patient to extract the sputum and keep the airway unobstructed. 11 days after admission, nurses and doctors completed the assessment and preparation of tracheal intubation before extubating, and gradually withdrew the machine and removed the oral tracheal intubation

**Oxygen support:** After removing the ventilator, we gradually remove the endotracheal intubation and gave this case continuous high-flow oxygen with the doctor. Two days later, the patient's oxygen support was changed to ordinary oxygen 2 L/min, the patient's pulse oxygen saturation was 100 %, and the results of blood gas analysis were satisfactory.

## **Protecting Skin Integrity and Cleanliness**

The case is critically ill, requiring long-term bed rest and long-term use of endotracheal intubation ventilators. According to pressure sore management standards, we need to take measures to prevent the occurrence of pressure sores [16]. We used rubber glove irrigation to make a water sac cushion, which was placed on the patient's face, one on the forehead and one on the mandible. Regular observation and replacement were carried out to make a face empty and prevent the compression of the facial bone trochanter. We used cushion pillows on the patient's chest, iliac, knees, small double-open cushions under the ventilator pipe. During the hospitalization in EICU, the skin injury site was well protected and began to heal, and there was no pressure on the injury site.

## **Strengthening Nutritional Support**

We chose nasogastric tube for enteral nutrition because the patient had tracheal intubation and could not eat through mouth [17]. When this case received enteral nutrition, we first raised the bed head by 30-40° and then adjusted the temperature and speed of the nutrition pump to prevent diarrhoea caused by too low temperature [18]. The nutrient solution was pumped at a constant rate of 50 ml/h to observe the patient's tolerance and the colour, quantity, and character of the stool. We ensured that the nasogastric tube of the patient was adequately fixed. When we handed over each other, we noticed whether his position changed. We timely inject warm water into the nasogastric tube to keep the line unobstructed. The patient did not have nutritional disorders throughout the treatment period.

### **Strengthening Management of CRRT (Continuous Renal Replacement Therapy)**

We gave the patient CRRT because of renal insufficiency. Before CRRT, the hemodynamic status of the patient was evaluated. Before the operation, the channel was confirmed to be in place and then the pipeline was pre-processed to start with a low flow rate and low flow rate. Changes in vital signs, stability of water-electrolyte, acid-base balance, coagulation, strict aseptic technique, and prevention of complications during dialysis [19].

### **Paying Attention to the Mental Health of this Patient**

The responsible nurse patiently communicated with the patient and introduced the case of disease outcome. During the epidemic period of COVID-19, due to the policy requirements, the family members were unable to visits, and the emotional needs of this patient were not satisfied. The responsible nurses connected with the family members of this case on the spot and video visit during the original visit period every day and let the family members record what they wanted to say or like music. The case was placed near the bed and played regularly, giving emotional support and psychological comfort to this case. During the intensive care period, the patient was emotionally stable and actively cooperated with treatment and nursing.

### **Strengthening Personal Protection Consciousness of Medical Staff**

Pneumonia caused by Chlamydia parrot is infectious to some extent [ 20]. And during the current COVID-19, medical staff should pay more attention to preventing infection and protecting themselves against fever. Medical personnel in the treatment and nursing, strictly abide by the hand hygiene and room disinfection norms, with circulating air ultraviolet air disinfection. Workers wiped the surrounding environment and object surface with 1000 mg/L chlorine disinfectant. The patient's changing laundry, bed sheets, and pollutants were strictly treated according to the certain bacterial infection.

## **IV. RESULTS**

During the COVID-19 pandemic, patients with similar symptoms to COVID-19 were subjected to rigorous screening and differential diagnosis. We used metagenomic sequencing to detect Chlamydia parrot and diagnosed pneumonia caused by Chlamydia parrot infection. We provided airway management, oxygen therapy, enhanced nutrition and skin integrity management, and prevention of infection based on the patient's specific circumstances. At the same time, due to the strict management policy of COVID-19, the patient could not be accompanied by his family in the emergency intensive care unit. Therefore, we also paid attention to the psychological situation of the patient and provided psychological care.

## Limitations

Studies have shown that the symptoms of *Chlamydia psittaci* pneumonia and new corona pneumonia are highly similar [21], and the differential diagnosis is particularly crucial during COVID-19. Gene sequencing can be used to identify [22]. For hospitals that do not support gene sequencing, how to identify new coronavirus pneumonia and parrot chlamydia pneumonia is worth exploring.

Because of the need for COVID-19 prevention and control policies, the cancellation of daily visits in intensive care units may hurt the psychology of this case. Although responsible nurses had adopted video visits and audio recording methods, it might still not meet the emotional needs of this case and their families. How to improve the emotional experience of this case and reflect the medical humanities needs to be further studied.

## V. DISCUSSION

Parrot Chlamydia pneumonia has specificity and infectivity, and the symptoms during the COVID-19 pandemic are similar to the new coronavirus pneumonia. Therefore, the related differential diagnosis and protective measures are critical in treating this case. In our case, the nursing measures used in the treatment have restored the patients to a certain extent and transferred them to the general ward. It is hoped that this case can provide some experience for medical staff to accept the same patients.

## VI. CONCLUSION

This case with severe pneumonia caused by parrot fever should pay attention to airway management. Based on doing an excellent job of basic nursing, psychological nursing for this case lacking accompaniment should be strengthened to promote the rehabilitation of this case.

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