

NURSING MANAGEMENT OF INEFFECTIVE AIRWAY CLEARANCE IN A PATIENT WITH BRONCHOPNEUMONIA: A CASE REPORT

Desy Merilla Erizon,^{a*} Kurniati Maya Sari,^b

^{a,b}Departement of Nursing, Diploma III Nursing Program, Akademi Keperawatan YPTK Solok, Solok, West Sumatra, Indonesia

**Corresponding author: desymerilla5@gmail.com
kurniatimayasarinia@gmail.com*

Abstract

Bronchopneumonia is an infection of the bronchi, bronchioles, and lung parenchyma that can lead to excessive mucus production and ineffective airway clearance. This condition is commonly characterized by productive cough, dyspnea, adventitious breath sounds, and increased respiratory rate, which may impair ventilation and gas exchange. A 67-year-old woman diagnosed with bronchopneumonia was admitted to the pulmonary ward with complaints of productive cough, shortness of breath, fever, and decreased appetite. The patient appeared weak and had difficulty expectorating sputum effectively. Physical examination revealed tachypnea, productive cough with thick sputum, oxygen saturation of 92%, and rhonchi on lung auscultation. Based on the assessment findings, the primary nursing diagnosis was Ineffective Airway Clearance related to airway hypersecretion, as evidenced by retained sputum, productive cough, and rhonchi. Nursing interventions included respiratory status monitoring, assessment of respiratory pattern and breath sounds, positioning the patient in a semi-Fowler position, teaching and assisting effective coughing techniques, encouraging adequate fluid intake as tolerated, and collaborating with the medical team regarding oxygen therapy and prescribed pharmacological treatment. Interventions were implemented throughout the four-day hospitalization period. Following the combined medical and nursing management, the patient demonstrated improved sputum expectoration, reduced dyspnea, respiratory rate decreased from 24 to 22 breaths/minute, oxygen saturation increased from 92% to 97%, and rhonchi were diminished on auscultation. The patient's respiratory status improved, indicating better airway patency and oxygenation. In this case, comprehensive nursing management implemented alongside pharmacological therapy was associated with improvements in airway clearance and respiratory status. These findings suggest that evidence-based nursing interventions, as part of multidisciplinary care, may contribute to improving airway clearance and supporting recovery in patients with bronchopneumonia.

Keywords: bronchopneumonia, ineffective airway clearance, nursing management, case report

INTRODUCTION

Bronchopneumonia is a lower respiratory tract infection characterized by inflammation of the bronchioles and adjacent lung parenchyma. Airway inflammation increases mucus production and impairs mucociliary clearance, resulting in secretion retention, ineffective airway clearance, and impaired gas exchange. These pathological changes commonly manifest as productive cough, dyspnea, tachypnea, fever, and adventitious breath sounds (Arofi et al., 2023; Metlay et al., 2019).

Pneumonia remains a major global public health problem and is a leading cause of infectious disease-related morbidity and mortality, particularly among children, older adults, and individuals with impaired immunity (World Health Organization, 2025). Excessive airway secretions are a major contributor to the nursing diagnosis

of Ineffective Airway Clearance, as retained secretions increase airway resistance, impair ventilation, and reduce oxygenation, resulting in ineffective cough, sputum retention, rhonchi, and dyspnea (Chen et al., 2022).

Nursing management plays a crucial role in maintaining airway patency and improving respiratory function. Evidence-based interventions, including respiratory assessment, semi-Fowler positioning, effective coughing techniques, adequate hydration, oxygen therapy, and multidisciplinary collaboration, have been shown to facilitate secretion clearance and improve respiratory outcomes in patients with bronchopneumonia (Metlay et al., 2019).

Although previous reports have described nursing care for patients with bronchopneumonia, relatively few have comprehensively presented the nursing process from assessment to evaluation using an evidence-based approach. This case report aims to describe the implementation of comprehensive nursing management for a patient with bronchopneumonia diagnosed with Ineffective Airway Clearance and to present the patient's clinical response to nursing interventions during hospitalization (Zade et al., 2023).

CASE PRESENTATION

Mrs. A, a 67-year-old woman, was admitted to the Pulmonary Ward of Mohammad Natsir Regional General Hospital, Solok City, with a physician-confirmed diagnosis of bronchopneumonia. She presented with a five-day history of progressive dyspnea, productive cough with difficulty expectorating sputum, intermittent fever, generalized weakness, and decreased appetite.

The patient had been hospitalized three times previously for bronchopneumonia and had a history of dust allergy with frequent dust exposure during household activities. She had no history of diabetes mellitus, hypertension, or other chronic diseases. Smoking status and influenza or pneumococcal vaccination history were unavailable, and no significant family history was reported.

On admission, the patient appeared weak and was receiving oxygen via nasal cannula at 4 L/min. Vital signs included blood pressure of 129/89 mmHg, pulse rate of 95 beats/minute, respiratory rate of 24 breaths/minute, body temperature of 36.6°C, and oxygen saturation of 92%. Respiratory examination revealed dyspnea, productive cough with difficulty expectorating sputum, rhonchi on auscultation, and retained airway secretions.

Laboratory findings showed normal hemoglobin (13.3 g/dL), leukocyte count ($7.2 \times 10^3/\mu\text{L}$), platelet count ($333 \times 10^3/\mu\text{L}$), renal function, and blood glucose levels. Red blood cell indices demonstrated low mean corpuscular volume (77.8 fL) and mean corpuscular hemoglobin (26.9 pg), with mildly elevated red cell distribution width (14.9%). Chest radiography, C-reactive protein, and sputum culture results were unavailable.

Based on the assessment findings, the priority nursing diagnosis according to the Indonesian Nursing Diagnosis Standards (SDKI, 2022) was Ineffective Airway Clearance related to airway hypersecretion, as evidenced by productive cough, retained sputum, difficulty expectorating secretions, rhonchi on auscultation, a respiratory rate of 24 breaths/minute, and oxygen saturation of 92%.

THERAPEUTIC INTERVENTION

The patient received oxygen therapy via a nasal cannula (3–4 L/min), adjusted according to oxygen requirements to maintain adequate oxygen saturation. Respiratory status, including respiratory rate, oxygen saturation, breath sounds, sputum characteristics, and the ability to expectorate secretions, was monitored throughout hospitalization.

Pharmacological therapy included intravenous ceftriaxone (1 g twice daily), intravenous methylprednisolone (125 mg twice daily), oral N-acetylcysteine (200 mg three times daily), Combivent inhalation (three times daily), oral paracetamol as needed, oral lansoprazole, and intravenous Ringer's lactate with aminophylline.

Nursing interventions focused on airway management and included semi-Fowler positioning, effective coughing exercises, encouragement of adequate oral fluid intake (approximately 2,000 mL/day if tolerated), and collaboration with the medical team in administering oxygen therapy and prescribed medications.

During the four-day hospitalization, respiratory status improved progressively. The patient demonstrated reduced dyspnea, more effective sputum expectoration, diminished rhonchi on auscultation, improved respiratory rate, increased oxygen saturation, and greater overall comfort.

OUTCOMES AND FOLLOW-UP

Following four days of combined medical and nursing management, the patient's respiratory status improved progressively. Respiratory rate decreased from 24 to 22 breaths/minute, while oxygen saturation increased from 92% to 97%. Dyspnea was reduced, sputum was expectorated more effectively, rhonchi became less prominent on auscultation, and the patient appeared more comfortable without signs of respiratory distress.

Overall, the patient demonstrated improved airway clearance, as evidenced by reduced sputum retention, improved breath sounds, and better oxygenation. No complications, including respiratory failure, decreased level of consciousness, mechanical ventilation, or secondary infection, were observed during hospitalization.

Before discharge, the patient and her family received education on effective coughing techniques, medication adherence, adequate fluid intake, environmental hygiene, and avoidance of dust exposure to reduce the risk of recurrence. A follow-up visit was scheduled to monitor recovery and reinforce treatment adherence.

DISCUSSION

This case highlights Ineffective Airway Clearance as the primary nursing problem in an older adult with bronchopneumonia. Excessive airway secretions impaired airway patency, resulting in dyspnea, productive cough, rhonchi, tachypnea, and reduced oxygen saturation. These findings are consistent with the pathophysiology of bronchopneumonia, in which mucus retention increases airway resistance, impairs ventilation-perfusion matching, and compromises gas exchange.

The patient's respiratory status improved following combined pharmacological treatment and evidence-based nursing interventions. Improvement was reflected by more effective sputum expectoration, reduced dyspnea, diminished rhonchi, a decrease in respiratory rate from 24 to 22 breaths/minute, and an increase in oxygen saturation from 92% to 97%. Among the nursing interventions, effective coughing exercises, semi-Fowler positioning, adequate hydration, respiratory monitoring, and oxygen therapy appeared to facilitate airway clearance and improve oxygenation. These findings support previous evidence demonstrating that airway management interventions can enhance secretion clearance and respiratory function in patients with pneumonia (Chen et al., 2022; Lodhi et al., 2025).

The management provided in this case is consistent with current international recommendations, which emphasize appropriate antimicrobial therapy combined with supportive respiratory care, including oxygen therapy, respiratory assessment, and individualized airway secretion management for patients with impaired airway clearance (Metlay et al., 2019). Older adults are particularly vulnerable to bronchopneumonia because age-related reductions in mucociliary clearance, cough effectiveness, and respiratory muscle strength increase the risk of secretion retention and delayed recovery. Therefore, early identification of ineffective airway clearance and timely implementation of evidence-based nursing interventions are essential to prevent respiratory deterioration.

Overall, this case demonstrates that comprehensive nursing management, integrated with pharmacological therapy, contributed to improved airway clearance, enhanced oxygenation, and progressive clinical recovery. These findings reinforce the important role of nurses in maintaining airway patency and supporting respiratory function in hospitalized patients with bronchopneumonia.

LIMITATIONS

This case report has several limitations. First, it describes a single patient, limiting the generalizability of the findings. Second, the observation period was restricted to hospitalization, preventing evaluation of long-term outcomes and recurrence. Third, chest radiography, C-reactive protein, and sputum culture results were unavailable, so clinical improvement was assessed primarily through physical examination and respiratory status. Finally, because nursing interventions were implemented alongside pharmacological therapy, the independent contribution of nursing management to the patient's clinical improvement could not be determined.

Despite these limitations, this case demonstrates the potential value of comprehensive, evidence-based nursing management as part of multidisciplinary care for improving airway clearance and respiratory status in patients with bronchopneumonia.

CONCLUSION

This case demonstrates that comprehensive nursing management, integrated with pharmacological treatment as part of multidisciplinary care, was associated with improved respiratory status in a patient with bronchopneumonia and Ineffective Airway Clearance. Evidence-based nursing interventions, including respiratory monitoring, semi-Fowler positioning, effective coughing exercises, oxygen therapy support, and patient education, contributed to improved airway patency, enhanced sputum clearance, and better oxygenation. These findings highlight the importance of early respiratory assessment, appropriate prioritization of nursing problems, and evidence-based nursing care to optimize patient outcomes. Further studies involving larger samples and longer follow-up are needed to strengthen the evidence supporting the effectiveness of individual nursing interventions.

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