

## Case Study on Nurse Care for Covid-19 Patients with MDRO (Multiple Drug Resistant Organism)

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### ABSTRACT

Covid-19 pandemic has made major changes in human civilization. Nurse care becomes more complex for Covid-19 patients who also confirmed with MDRO. MDROs are bacteria resistant to three or more antimicrobials from different classes. This study aims are to know nurse care of patients with Covid-19 and MDRO. The design of this study is qualitative method (case study). The subjects were two patients with Covid-19 and MDRO in Isolation Intensive Care Unit which chosen by purposive sampling. Data collection techniques were physical and supporting examination, medical record review. Data from the analysis were written descriptively. Priority nursing diagnoses was impaired gas exchange related to ventilation-perfusion imbalance. After being treated in Isolation intensive care unit for approximately 14 days, the patient was able to breathe spontaneously with an O2 nasal cannula. Nurse role is to provide comprehensive treatment to critical patient and obey the prevention infection regulations in order to prevent virus transmission. Nurse care is carried out based on isolation precautions (droplet and contact transmission). Nurses are expected to provide professional nurse care to Covid-19 patients with MDRO, so the quality of care remains up to standard even during pandemic.

Keyword: nurse care; Covid-19; multiple drug resistant organisms

## INTRODUCTION

MDRO (Multiple Drug Resistant Organism) is a serious problem that cause an increase in patient mortality and morbidity. This problem becomes more complex, especially during the Covid-19 pandemic. Patients with confirmed Covid-19 and MDRO are two serious challenges that nurses must face in providing nurse care to patients, especially in Intensive Isolation Care Unit.

MDRO is bacteria or organisms that are resistant to at least one antibacterial from > 3 antimicrobial groups. This resistance is caused by excessive use of antibiotics. Some of the germs that often cause this problem are Methicillin Resistant *Staphylococcus aureus* (MRSA), Vancomycin Resistant *Enterococci* (VRE), Penicillin Resistant *Pneumococci*, Extended spectrum beta-lactamase-producing *Klasiella pneumoniae* (ESBL), Carbapenem-resistant *Acinetobacter baumannii* (CRAB), and multi-resistant *Mycobacterium tuberculosis*. Epidemiologically, it is predicted that 2 million people will experience infection by MDRO bacteria of which 23,000 die each year because of this (Agatha et al., 2018).

According to a 2009 study, patients who were hospitalized for a long time in intensive care unit were more susceptible to infection with antibiotic-resistant bacteria. Infected patients have a mortality rate twice as high as those who are not infected. Studies in the ICU dr. Cipto Mangunkusomo Hospital found that the majority of the causes of antibacterial resistance were multidrug resistant *Acinetobacter baumannii* (23.3%), multidrug resistant *Pseudomonas aeruginosa* (20.71%), and *Klebsiella pneumonia* (15.86%) (Agatha et al., 2018).

The study conducted at dr. Soetomo Hospital showed that the high patient mortality rate may be caused by irrational use of antibiotics or not in accordance with the latest guidelines where the mortality rate reaches 92.3% (Syarofi, 2019). Severe and critical Covid-19 patients who also experience MDRO infections in Isolation Intensive Care Unit must receive high attention from nurses who provide nurse care. The combination of the corona virus that causes Covid-19 and MDRO microbes which are resistant to antibiotics is a double challenge. It requires maximum and professional effort from the nurse in Isolation Intensive Care Unit.

PPNI DPP Covid-19 Nursing Care guidelines stated that from scientific evidence, transmission of Covid-19 occurs through contact and droplets. Infection Prevention and Control in Intensive Care Unit for Covid-19 patients begins

with carrying out standard precautions, using complete PPE (with contact and droplet precautions), carrying out work safety practices, using antiseptics, handling equipment in patient care and environmental hygiene (DPP PPNI, 2020).

Treatment in the intensive care unit is more complex and dynamic due to the instability of the patient's condition and requires more attention from nurses. Competent nurses are able to respect their profession and their patients in providing nurse care. Nurse care is not only limited to technical aspects but also psychological aspects. The nurse's role is to help the patient's needs through therapeutic interventions. Nurses not only save lives but also help patients meet their needs. Nurses must also be able to build interpersonal relationships and interprofessional collaboration for patient recovery (Rohmawati et al., 2021). Nurses play an important role in providing comprehensive care both during the pandemic and before the pandemic. The role of nurses when caring for Covid patients is to identify, treat, monitor, and evaluate patients. Nurses are responsible for providing care to critically ill patients (Manurung et al., 2021).

Based on the above phenomenon, researchers are interested in conducting a case study regarding the management of nurse care in critical Covid-19 patients with MDRO infection who were treated in Isolation Intensive Care Unit.

## METHOD

This research design uses a qualitative method in the form of case study. Case studies proof to explore the data and sources information more depth and detail especially about nurse care. The research subjects were two Covid-19 and MDRO patients who were being treated at Isolation Intensive Care Unit, Bali Mandara Hospital. Research subjects were selected based on purposive sampling technique. The initial patients were IGCW (male) and WCD (male). Data was collected twice for each patient. Data collection techniques used were physical examination, supporting examination, medical record review, observation, and documentation. Data analysis was carried out by examining the five stages of the nurse care process, such as assessment, diagnosis, intervention, implementation and evaluation (Sumaryati, 2018). The data from the analysis of this case study were written descriptively.

## RESULT

Nurse care process consists of five stages, such as assessment, diagnosis, intervention, implementation, evaluation. The assessment of the two Covid-19 and MDRO patients in Isolation Intensive Care Unit was carried out in two sessions. First in critical phase and second in recovery phase. The results are as follows:

### Assessment

From the results of the assessment in the critical phase of patient IGCW (July 27, 2021) it was found that the patient had a deteriorating condition (tachycardia with unstable heart rhythm). Due to the worsening lung condition leading to respiratory failure, the patient was put on a ventilator with PC mode SIMV, FiO<sub>2</sub> 100%, VT 511, PEEP 8, ASB 5, SpO<sub>2</sub> 98%, RR 14/16. In addition, the patient was also placed on a CVC to include therapy and parenteral nutrition to make it more adequate. For the fulfillment of oral nutrition, the patient was attached NGT. Sputum culture found the growth of bacteria *Acinetobacter baumannii*.

The second study conducted on patient IGCW (11 August 2021) found that the patient's overall condition had improved. The patient's airway is patent, breathing spontaneously with a nasal cannula 4 liters per minute. And the results of the sputum culture did not find bacterial growth. The patient was transferred to a regular inpatient ward.

From the results of the assessment in the critical phase of the second patient (WCD) on October 16, 2021, it was found that because the patient's condition led to respiratory failure, a PC SIMV mode ventilator was installed, FiO<sub>2</sub> 80%, VT 467, PEEP 5, ASB 5, SpO<sub>2</sub> 95%, RR 20/21. The patient also received 0.3 mcg Norepinephrine support. In addition, the patient was also placed on a CVC to include therapy and parenteral nutrition to make it more adequate. For the fulfillment of oral nutrition, the patient was attached NGT. The results of the MRSA screening were positive.

The second review on November 3, 2021, found that the patient's overall condition was improving. The patient's airway is patent, breathing spontaneously with a nasal cannula 4 liters per minute. The patient was transferred to a regular inpatient ward.

### Nursing Diagnosis

Impaired gas exchange related to ventilation-perfusion imbalance characterized by shortness of breath, decreased consciousness

### Interventions

The interventions carried out in critical phase of care are: 1) Monitor respiratory rate, rhythm, depth and effort of breathing 2) Monitor breathing pattern 3) Monitor sputum production 4) Auscultate breath sounds 5) Monitor AGD value and oxygen saturation 6) Maintain a patent airway (periodic suction) 7) Monitor for symptoms of increased breathing 8)

Head Up 45-60 degrees to prevent aspiration and bundle VAP (Ventilator Associated Pneumonia) 9) Giving prone position when hemodynamically stable 10) Reposition every 2 hours 11) Collaboration of ventilator mode selection 12) Delegative in the provision of therapy or medication (PPNI, 2019b).

### Evaluation

After being treated for approximately 14 days, the patient was able to breathe spontaneously with a nasal cannula and was transferred to a regular inpatient room. In both patients, the hemodynamically data were stable, increase of consciousness, airway and breathing are better.

## DISCUSSION

Assessment is the first step in nurse care process. In this case study study, objective and subjective data were collected to formulate the patient's problems or needs. The assessment carried out on both patients was a comprehensive assessment. The assessments used in the intensive room with the A-I rules are: airway, breathing, circulation, disability, electrolyte, fluid, gastrointestinal, hematology, infection (Muthia, 2016).

In both patients, severe COVID-19 symptoms appeared were dyspnea and decreased consciousness. It is not possible to examine subjective data in patients who have invasive devices installed. Nurses can conduct an assessment to obtain objective data. The level of dependence of patients in intensive care unit is categorized into intensive care where the level of patient dependence is high. At this stage, nurse must meet the needs of patient and carry out careful monitoring because the patient has limitations and decreased consciousness (Ginting, 2019).

From the results of the assessment, priority nursing diagnoses was impaired gas exchange related to ventilation-perfusion imbalance characterized by shortness of breath, decreased consciousness (PPNI, 2019a). Nursing care has been carried out in accordance with the Indonesian Nursing Intervention Standards, and COVID-19 critical nursing care such as respiratory monitoring, oxygen therapy, mechanical ventilation management, insertion of an artificial airway, and airway management to improve gas exchange in both lung fields.

The goals or outcome criteria are after nurse care in isolation intensive care unit, we expected to increase gas exchange with the criteria such as decreased dyspnea, respiratory rate 12-20 times per minute, SpO<sub>2</sub> > 90%, cyanosis does not occur, rhonchi decrease, AGD examination is within normal limits. (PaO<sub>2</sub> > 80 mmHg, PaCO<sub>2</sub> 35-45 mmHg, pH 7.35-7.45) (PPNI, 2019c).

Nurse care planning is very important to support the continuity of patient care. Nurse care must be able to meet the unique and different needs of patients. So nurses must monitor the patient's condition regularly (Christina et al., 2019). In addition, the treatment of covid patients can be carried out with the nursing core theory of care, Lydia Hall's cure. The care aspect focuses on the goals of nursing care by facilitating patient comfort by helping to meet the basic needs of patients when they cannot do it independently. The core aspect is the nursing aspect that focuses on the social, emotional, spiritual, and intellectual needs of the patient comprehensively. The cure aspect is therapy or the medication given to the patient (Elyas, 2022).

In both patients, hemodynamic monitoring was also carried out. The patient's vital signs should be monitored closely, including changes in level of consciousness, respiratory rate, and oxygen saturation. Observe for symptoms such as cough, sputum, chest compression, dyspnea, and cyanosis. In patients on a ventilator, note the presence of lung injury as a side effect of using a ventilator. Secretion management was also performed in both patients. One of them is with suction. Management of secretions will increase the patient's airway clearance so that it is more patent and effective. Suction is also useful for reducing the formation of aerosols and droplets. Patients on a ventilator should pay attention to the VAP (Ventilator-Associated Pneumonia) bundle. The VAP bundle can reduce the VAP rate by washing hands, raising the bed at the head to 30-45 degrees if there are no contraindications, performing oral hygiene, monitoring patient nutrition. Prone position can be performed in hemodynamically stable patients. This position will reduce alveolar pressure and avoid alveolar collapse. What should be noted is the presence of complications such as dislodged venous access and endotracheal tube, facial edema, hemodynamic instability, brachial injury, impaired vascular flow (DPP PPNI, 2020).

According to the theory, patients in the intensive care unit with total bed rest should be shifted to the right and left oblique positions in order to prevent pressure ulcers and reduce the risk of ventilator associated pneumonia (VAP). However, because the patient's hemodynamic condition is unstable, this intervention cannot be carried out optimally.

Nurse must pay attention to contact precautions because the patient has an MDRO infection. There are studies that state a successful antibiotic administration strategy is not only about controlling the quantity of administration but also monitoring the rational use of antibiotics to reduce antibiotic resistance. Monitoring the use of antibiotics can prevent and reduce the incidence of antibiotic resistance. In the future, it is hoped that there will be an evaluation of wiser and more selective selection and use of antibiotics in prescribing antibiotics through updating the recursive map data (Ertiana

& Pratami, 2021). This is where nurses act as patient advocates so nurses can collaborate and consult with the DPJP (the doctor in charge of the patient) and the pharmacy that carries out drug reconciliation.

There are studies which state that the current MDRO is an iceberg phenomenon. There are actually a lot of unrecorded and undetected cases. The nurse's role is to provide IEC (Information, education, communication) to patients and their families regarding the regulation of purchasing medicines at pharmacies during treatment at home and the use of antibiotics with no prescription.

Transmission of pathogenic germs can occur in the process of patient care in hospitals, either direct or indirect contact. Transmission by hand is the most common transmission in health services. Therefore, WHO has declared 5 moments of hand washing (Subhan et al., 2021). Nurses who carry out nursing care must comply with and implement hand hygiene at 5 moments according to WHO standards.

Before nurse do every treatment to patients, they must carry out the infection prevention and control protocol for contact transmission-based precautions. They had to do hand hygiene, wear complete and proper PPE, not wear PPE in and out of the room, ensure the cleanliness of the room to prevent contamination. PPE is a tool used to protect nurses from illness or injury due to contact with hazardous objects or materials. The use of PPE for nurses when treating Covid-19 patients aims to protect nurses from the dangers of exposure to the corona virus when providing nursing care, create a sense of security and protection, increase work motivation, maintain, and improve work safety. During a pandemic, the important thing is not only the use of PPE but also the release of PPE. Because the removal of PPE that is not in accordance with the procedure can increase the risk of relapse or transmission of the virus. It is also important to disinfect surfaces around the patient with a standardized antiseptic solution. Environmental decontamination must be a concern for nurses.

## CONCLUSION

This case study found that priority nursing diagnosis of two Covid-19 patients who experienced MDRO infection was impaired ventilation perfusion associated with ventilation perfusion imbalance characterized by shortness of breath and decreased consciousness. Nurse's important role is to carry out optimal and comprehensive monitoring. Optimal monitoring is important in evaluating the progress of patient care. In addition, in the case of MDRO with contact precautions, nurses must really understand and implement the Infection Prevention and Control protocol. This is important to break the chain of transmission and also to maintain the health and safety of nurses.

Hospital will gain an understanding of critical Covid-19 nursing care and MDRO in the Intensive Isolation Room so that in the future nurses will be more prepared and alert to face the pandemic. With comprehensive readiness nurses are able to provide professional nursing care, according to applicable standards by prioritizing patient safety, patient centered care, and still paying attention to occupational health and safety. In addition, with an understanding of MDRO nurses are able to collaborate and consult with PPA (Professional Care Providers) regarding the administration of antibiotics during patient care.

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