CASE REPORT

Implementing Prone Position and Nursing Consideration in Non Intubated Covid-19 Patients: A Case Report

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ABSTRACT

The need for mechanical ventilation increased rapidly, in line with the surge in COVID-19 cases. Giving the prone position is one form of Evidence-Based Nursing practice and has proven beneficial for patients with respiratory distress due to COVID-19 infection. This study aims to present that pronation is an effort to prevent COVID-19 patients with mild to moderate symptoms from falling into severe conditions. We report two cases of COVID-19 patients with moderate symptoms who are not intubated. Pronation is carried out in 9 to 15 days, either using Non-Invasive Ventilation or High Flow Nasal Cannula. By implementing the pronation, the need for oxygen fraction can be weaned, and hemodynamic parameters stabilize. The provision of pronation in COVID-19 cases is considered to reduce the high number of needs for mechanical ventilation in the COVID-19 pandemic.

Keywords: COVID-19; Evidence-Based Nursing; pronation

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INTRODUCTION

Many studies recommend pronation positioning to increase oxygenation requirements in patients with acute respiratory distress syndrome (ARDS). In a meta-analysis publication and clinical trial of Prone Position in Severe ARDS (PRO – SEVA), positioning has been recognized as having significant benefits on patient life expectancy (1). Besides benefiting patients with acute symptoms intubated, physically offering the prone posture is also suitable for ARDS patients who are conscious but not using mechanical ventilation. Before the pandemic Corona Virus Disease 2019 (COVID-19) broke out, the literature regarding the pronation position in patients who were not intubated was still very minimal (2).

The health care system is overwhelmed by the increasing number of patients requiring mechanical ventilation and the lack of health workers in the field. In addition, the prognosis of patients with intubated COVID-19 infection is highly variable and unpredictable (3). There is, therefore, an increasing focus on strategies to prevent worsening of the patient's condition and the high rate of mechanical ventilation with pronation attempts. This case report discusses the successful implementation of nursing in the pronation position in patients with confirmed severe COVID-19 in terms of its application in patients.

MATERIALS AND METHODS

This is a case report of 2 patients with ARDS undergoing High Flow Nasal Cannula (HFNC) and Non-Invasive Ventilation (NIV) in the Intensive Care Unit (ICU). The data collection techniques included interviews, observations, physical examinations, and medical records. The data were analyzed to determine nursing problems and to review the effectiveness of the interventions that have been applied to resolve patient's nursing problems. Ethical approval was obtained from the ethics committees of the Universitas Indonesia Hospital (Reference No. 0049/SKPE/KKO/2021/00).

CASE REPORT

Case 1 Overview

On October 19, 2020, a 50-year-old male was admitted to our hospital with fever, increased work of breathing, dry cough, nausea, myalgia, diarrhea, and dyspnea. His medical story was non-contributory, and he had no history of systemic illness. On October 22, 2020, the

Table I. Pre – Intra – Post Hemodynamic in Prone Position (October 29, 2020)

Time	Type of Ventilation	SBP	DBP	MAP	HR	RR	SpO_2	ECG	Alert
Pre prone	HFNC 60%	119	76	92	97	16	98	Sinus Rhythm	Compos Mentis
1 hour prone	HFNC 60%	115	76	86	96	18	99	Sinus Rhythm	Compos Mentis
2 hours prone	HFNC 60%	104	74	85	86	20	99	Sinus Rhythm	Compos Mentis
Post prone	HFNC 60%	107	75	87	79	18	98	Sinus Rhythm	Compos Mentis

SBP: Systolic Blood Pressure, DBP: Diastolic Blood Pressure, MAP: Mean Arterial Pressure, HR: Heart Rate, RR: Respiratory Rate

patient was admitted to our ICU. HFNC was immediately started. The patient clinically deteriorated, his oxygen saturation was 92%, the first 2-hour ROX index ranged from 5.89 – 6.58, his blood pressure, and heartbeat was relatively stable. (Table I)

On October 24, 2020, NIV was started. The patient remained on NIV for 24 hours, and remained in the prone position for 2 hours four times a day. After two days of pronation, the patient made minimal improvements in oxygenation. Pronation was continued every 2 hours 4 times a day. On October 23, 2020, the FiO_2 was weaned to 60%. From October 26, 2020, to October 27, 2020, the pronation position was temporarily postponed due to the unstable hemodynamic.

On 29 – 31 October 2020, the patient was started in the pronation position again for 2 hours 4 times a day. On November 1, 2020, the patient was used HFNC. On November 3, 2020, the patient was tried to be weaned using a Non-Rebreathing Mask 10 L/min. The pronation position continued with the same cycle until November 7, 2020, the patient started using the nasal cannula, and was transferred to the High Care Unit (Fig. 1).

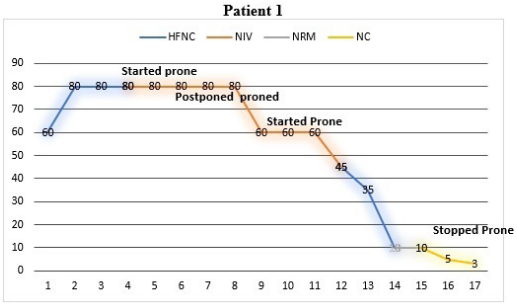

Figure 1: Patient 1. FiO2 (y-axis) on different days (x-axis). The blue line shows the patient on HFNC, the orange line shows a patient in NIV, the grey line shows a patient in NRM, and the yellow line shows a patient in NC. L/min on NRM and NC has been converted to approximate FiO2. HFNC indicates high-flow nasal cannula; NIV, Non-Invasive Ventilation, NRM, Non-Rebreathing Mask, NC, nasal cannula.

Case 2 Overview

On August 26, 2020, a 29-year-old female patient diagnosed with COVID-19 pneumonia was transferred to our hospital. She was presented with a 5-day history of sore throat, myalgia, and anosmia. She was obese, febrile, SpO_2 95% on room air, and tachycardic. Chest X-ray revealed a rounded opacity on the right midlung concerning pneumonia. Laboratory results were significant for lymphocytopenia and elevated C-Reactive Protein (Table II).

Table II. Pre – Intra – Post Hemodynamic in Prone Position (September 10, 2020)

Time	Type of Ventilation	SBP	DBP	MAP	HR	RR	SpO_2	ECG	Alert
Pre prone	HFNC 45%	86	51	64	82	17	97	Sinus Rhythm	Compos Mentis
1 hour prone	HFNC 45%	106	63	68	81	18	99	Sinus Rhythm	Compos Mentis
2 hours prone	HFNC 45%	104	59	73	81	17	98	Sinus Rhythm	Compos Mentis
Post prone	HFNC 45%	106	62	85	83	20	97	Sinus Rhythm	Compos Mentis

SBP: Systolic Blood Pressure, DBP: Diastolic Blood Pressure, MAP: Mean Arterial Pressure, HR: Heart Rate, RR: Respiratory Rate

On August 31, 2020, the patient developed worsening tachypnea and desaturation. The mask was then replaced with HFNC. Her hypoxemia continued to worsen over the next 2 days. Prone position was suggested due to severe hypoxemia. Alprazolam was started with a positive response, and the next day, the patient was better able to tolerate the prone position. Within few hours of doing prone position, her SpO_2 values improved, and FiO_2 was titrated down. Patient continued to do prone position and was able to wean down to 6 L/min masks by day tenth of prone position (Fig. 2).

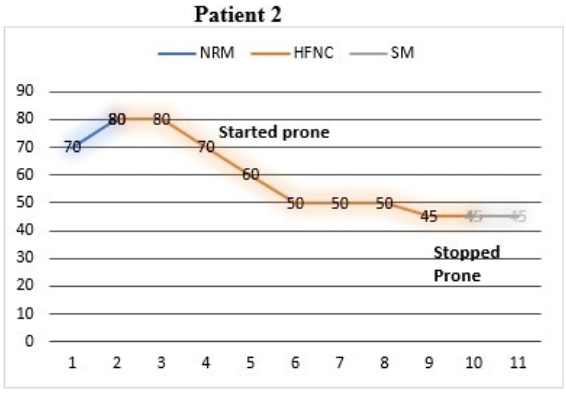

Figure 2: Patient 2. FiO2 (y-axis) on different days (x-axis). The blue line shows the patient on NRM, the orange line shows the patient in HFNC, grey line shows the patient in SM. L/min on NRM and SM has been converted to approximate FiO2. NRM indicates Non-Rebreathing Mask, HFNC indicates high-flow nasal cannula, SM, Simple Mask.

DISCUSSION

The main nursing problem in these cases are the impaired gas exchange, and the risk of damage to skin integrity. Nursing actions that have been carried out include observation of hemodynamic, evaluation of the ROX Index, suctioning of oral mucus, performing oral hygiene, motivating, training, assisting patients in breathing exercises, and identifying the causes of impaired skin integrity include changing positions, doing back rubs, and observing pressure in the nose and cheeks due to the use of NIV masks.

The implementation of evidence-based nursing is the application of pronation in patients without mechanical ventilation. The goal is to improve oxygenation, prevent hypoxemia, and intubate. Patients without mechanical ventilation are included in the category of patients at low risk for pronation (4). However, with a lower risk in patients who are not intubated for pronation, patients still need close monitoring, and the pronation cannot be used as a substitute for intubation therapy. Some literature recommends pronation for thirty minutes to 8 hours, 2 to 3 times per day. As observed in various studies, pronation can be safely performed in patients using a nasal cannula, HFNC, or NIV, if the patient can participate actively (5).

The problems that often arise with pronation in intubated patients can be minimized in patients who are not intubated. Other nursing problems that may be faced include how to reduce patient anxiety during pronation. Thus, this is where the nurse's role as an educator is to convince the patient cognitively, affectively, and psychometrically that giving pronation is one of the efforts in preventing the deterioration of the patient's condition.

CONCLUSION

Based on available evidence, pronation of not intubated patients has been recommended to prevent worsening of the patient's condition requiring intubation. Thus, the healthcare team, especially nursing, must understand that the management of pronation in not intubated patients to provide comprehensive nursing care. Pronation of a not intubated patient can be used in a variety of situations.

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