

Implementation of Semi Fowler Position, and Clapping Technique to Increase Oxygen Saturation and Decrease Respiratory Rate (RR) in COPD Patients in ICU Hospital X BSD

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Article Info

Keywords:

Semi Fowler Position,
Clapping Technique,
Oxygenation,
COPD

ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is an irreversible condition characterized by shortness of breath during activities and disruption of air flow in and out of the lungs. COPD has the main symptoms, namely shortness of breath, coughing, increased sputum production. One of the non-pharmacological measures for patients with COPD to maintain comfort and facilitate respiratory function is the semi-Fowler position and providing physiotherapy using the clapping technique. The aim of this research is to determine the relationship between giving the semi-Fowler position and the clapping technique to increasing oxygenation. This research method uses a case study of an 85 year old woman, with a diagnosis of COPD who was treated in the ICU, on the 8th day of treatment with a general condition of looking seriously ill, experiencing shortness of breath with RR 30x/minute and Spo2 80%. The semi-Fowler position intervention was carried out at an angle of 30 - 45 degrees for + - 6 hours and the clapping technique was carried out for + - 10 minutes, the clapping technique was carried out in the morning and evening after the nebulizer was applied. There was an effect of increasing oxygen saturation before being given the semi-fowler intervention and giving physiotherapy using the clapping technique, where Spo2 was only 90% but after being given the intervention Spo2 reached 94% - 95%. Thus, giving COPD patients the semi-Fowler position and clapping technique should be given to improve the patient's oxygenation requirements during the treatment period.

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of death. The World Health Organization in 2019 revealed the number of deaths of people with chronic obstructive pulmonary disease (COPD), which was 3.23 million deaths (Varmaghani, 2019). Based on the Non-Communicable Disease Profile in 2016, the number of people with COPD in Indonesia by age group, mostly in the 60-year-old age group, is 1,809 suffering from COPD (Ministry of Health of the Republic of Indonesia, 2017).

Chronic obstructive pulmonary disease (COPD) is defined as a heterogeneous lung disorder characterized by chronic respiratory complaints (shortness of breath, cough, phlegm production) due to airway abnormalities (bronchitis, bronchiolitis) and/or alveoli (emphysema) that cause persistent and often progressive obstruction of airflow (Lung P, 2020). COPD is a progressive lung disease where the initial symptoms are intermittent and then appear every day and then experienced throughout the day (August A, 2023). This condition causes COPD patients to easily experience recurrence that requires repeated hospitalizations in the hospital.

Based on a study by Harries et al. (2017), it shows that 32.2% of COPD patients return to the hospital at least once within one year, 17.8% are readmitted to the hospital within 90 days and 10.2% are readmitted to the hospital within 30 days. COPD has the main symptoms, namely tightness, coughing, increased sputum production. At an advanced stage, COPD results in impaired activity tolerance, fatigue, loss of appetite, weight loss, and sleep disturbances (Smeltzer & Bare, 2001 in Dian, 2015).

Self-interventions undertaken to address these problems include: setting semi-fowler sleep positions, monitoring respiratory rate, and breathing depth (Smeltzer & Bare in Aini's study, et al, 2008). The position that can be given is with a semifowler position. Management that can be done in an effort to help secrete discharge can be done by clapping techniques. Clapping is a powerful blow, not by any means, to the chest and back walls with the hands shaped like a bowl aimed at releasing secretions attached to the bronchial walls. The purpose of applying the semifowler and clapping position is to help patients with chronic obstructive pulmonary disease (COPD) in excreting sputum and increasing oxygen saturation.

Based on the results of observations conducted at ICU Hospital X on December 10, 2024. It was found that patients with COPD were in a state of shortness of breath with a 2-pillow sleeping position, with a semifowler position without paying attention to the degree of inclination of the sleeping position and the administration of High Flow Nasal Canul (HFNC) T20 M15 FiO2 65%, SpO2 93% and RR 24x/min. Patients also tend to cough but are unable to expel phlegm, thus worsening the patient's oxygenation condition.

METHODS

The method in this study uses a case study of an 85-year-old woman, with a diagnosis of COPD who was treated in the ICU, day 8 treatment with a general condition of severe pain, experiencing shortness of breath with an RR of 30x/minute and Spo2 of 80% with an intervention carried out on December 11 to 12, 2024. Semi-fowler posture at an angle of 30 - 45 degrees for +- 6 hours and the clapping technique is carried out for +- 10 minutes, the clapping technique is carried out in the morning and evening after the nebulizer is performed.

RESULTS AND DISCUSSION

An 85-year-old female patient came to the emergency room with complaints of shortness of breath that had lasted 2 weeks, but it had worsened since 2 days. Cough is accompanied by fever complaints, 1 week before the patient has been treated, but the complaints of shortness of breath have not decreased. The results of the examination of the general condition

appeared to be seriously ill, with vital signs in the emergency room S: 38.5, N: 120x/min, RR: 33x/min, TD: 140/80 mmHg, Spo2: 80%. While in the emergency room, the patient was examined for AGD with the results of AGD pH: 7.51, PO2: 169, PCO2: 33.7, BE: 8.6, HCO3 -: 32.7, O2 saturation: 85%, Conclusion: Respiratory alkalosis was partially compensated when the patient was installed with NRM 15 lpm in the emergency room. Then the patient is recommended to be admitted to the ICU with a diagnosis of COPD.

Patients enter the ICU, complain of extreme shortness of breath, cough with phlegm, slurred speech, tend to use the abdominal breathing support muscles, ronchi in both lung fields. While in the ICU, a general condition examination is carried out; The patient appeared to be severely ill, with GCS E4V5M6, Temperature: 38.2 °C Pulse and HR: 112 x/min, P: 30 x/min, TD: 135/84 mmHg. MAP: 101 mmHg SpO2: 80% with NRM 15 lpm. The patient was immediately given *High Flow Nasal Canul* (HFNC) T20 M 35 FiO2 65%, so that SpO2 was 93% and RR was 24x/min. Disease History: The patient has a history of DM, Hypertension, Asthma, Glaucoma with routine medications: CPG 1x75 mg, Crestor 1x20mg, Jardiance 1x10 mg, Candesartan 1x16 mg, drops for glaucoma. History of Allergies: none. The patient's family also said that the patient had asthma, but did not routinely control it. Asthma in patients is triggered when they are too tired, or the air at home is too cold.

In these cases, the nursing diagnoses found included (1) gas exchange disorders b.d ventilation imbalance - perfusion marked by DS: The patient complained of tightness. DO: AGD Yield: pH: 7.51, PO2: 169.2, PCO2: 33.7, BE: 8.6, HCO3: 32.7, O2 Saturation: 85%. Conclusion: Respiratory alkalosis is partially compensated. (2) Ineffective airway clearance b.d restrained secretions are characterized by DS: Patients say they feel tight occasionally, especially if the sleeping position is too supine, Patients also say there is a cough, phlegm is difficult to expel. DO: Ronchi breathing sounds in both lungs, coughing is not effective. TTV Result: Temperature: 38,2 °C, Pulse and HR: 112 x/min, P: 24 x/min, TD: 135/84 mmHg. MAP: 101 mmHg SpO2: 93%. The intervention carried out on this patient is oxygenation management. One of the non-pharmacological procedures given to patients is the provision of semifowler positions and physiotherapy using *clapping techniques*. The patient was intervened on December 11 to 12, 2024. *Semi-fowler posture* at an angle of 30 - 45 degrees for +- 6 hours and the *clapping* technique is carried out for +- 10 minutes, *the clapping* technique is carried out in the morning and evening after the *nebulizer* is performed. This research is in line with a study conducted by Singal (2023), entitled "*a study on the effect position in COPD patients to improve breathing patterns*" found that 64% of patients were better in the 30-45° position, 24% in the 60° position, and 12% of patients were better in the 90° position.

Table 1.Monitoring Observation Sheet of Spo2 and RR Results

Day 1	PRE		POST	
	SpO2	RR	SpO2	RR
<i>Semifowler's position</i>	90%	27x/ min	94%	23x/ min
<i>Physiotherapy with Clapping Technique</i>	90%	27x/ min	95%	22x/ min

From these results, it was found that the respiratory rate and SpO₂ before being given the semifowler position were 27x/min with SpO₂ 90% and after being given the semifowler position +/- 6 hours, the respiratory rate (RR) decreased by 22x/min and the SpO₂ increased by 94%. The semifowler position is given for 6 hours by raising the head 45 degrees. Observation results were also obtained after being given the semifowler position, there was no use of breathing support muscles, and the patient said that the feeling of tightness was reduced. This is in accordance with research (Astriani et al., 2021) the Semi Fowler position is used to reduce and overcome dyspnea. The semi-fowler position refers to a partially upright or sitting position where the position of the head of the bed is raised to a 45° angle. This position is used to ensure the patient's comfort and help improve his or her respiratory function (Sitorus et al., 2021). The semi-Fowler position is usually given to patients with dyspnea and at risk of hypoxia, such as people with pulmonary tuberculosis, asthma, chronic obstructive pulmonary disease (COPD), and cardiovascular conditions, with a slope of 30-45°14. Adjusting the patient's position can facilitate adequate breathing, the semifowler position can increase lung expansion so that oxygen enters the lungs more easily and optimal breathing patterns (Yuliani, 2020). Oxygen therapy is given to patients to reduce shortness of breath, while semi-fowler positions aim to reduce the risk of chest wall development (Potter et al, 2020). The simplest and most effective method to reduce the risk of decreased chest wall development is by adjusting the position while resting. The most effective position for patients with oxygenation problems is given a semi-fowler position (Majampoh et al, 2020). This study is in accordance with (Singal & Daviputra, 2021) that the effect of position in COPD patients on the improvement of respiratory patterns. It was found that 64% of people preferred a 45-degree position with a pillow position at a 60-degree angle in 24% of people and 12% of people preferred a 90-degree position with a pillow. In the case of severe asthma patients suggest a 90-degree position with a pillow and COPD patients suggest a 45-degree position with a pillow.

From table 1, it was found that the respiratory rate before the physiotherapy action of *the clapping technique* was 25x/minute, and the SpO₂ was 90% after the action the respiratory rate decreased by 22x/minute and the SpO₂ was 95%. From these results, it was found that the provision of *clapping techniques* was very useful in reducing shortness of breath. The results of observation were also obtained that after the *clapping* action after inhalation made the patient able to expel phlegm compared to only inhalation. According to Setiawan (2021) research, the application of chest physiotherapy is very effective in efforts to remove secretions and improve ventilation in the lungs of patients with impaired lung function, so that oxygen saturation in patients can increase. According to Yulianti's research (2022), the application of *clapping* in COPD patients has a great effect on sputum production compared to patients who do not undergo chest physiotherapy (Devia, 2023).

The results of the interventions that have been carried out provide results that oxygenation management in patients with COPD, one of which is through the intervention of giving a semifowler position and providing physiotherapy with clapping techniques is able to reduce the patient's RR, so that the patient does not complain of tightness. However, it should

also be noted that after the patient's RR has started to return to normal and the patient's complaints of tightness have decreased, it is necessary to do weaning in the administration of oxygen, it is feared that there is oxygen poisoning in the patient. Patients who have received long-term oxygen therapy require an evaluation of re-analysis of blood gas or oxygen saturation when breathing room air, as well as oxygen levels received during therapy to confirm the need for supplemental oxygen.

CONCLUSION

There was an effect of increasing oxygen saturation before the semifowler intervention and physiotherapy with clapping techniques, where Spo₂ was only 90% but after being given Spo₂ intervention reached 94% - 95%. Thus, the provision of semi-fowler positions and clapping techniques in COPD patients should be given to improve the fulfillment of patient oxygenation during the treatment period..

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