THE EFFECTIVENESS OF HIGH FLOW NASAL CANNULE OXYGENATION THERAPY (HFNC) ON CHANGES IN OXYGEN SATURATION IN COVID-19 WAS CONFIRMED IN PATIENTS IN COVID-19 ICU AT DUSTIRA HOSPITAL LEVEL II IN CIMAHI

Setiawati, Oyoh, Lyta
The Nursing Science Study Program
Corresponding Autor Setiawati
Email Setiawatimkep@gmail.com

ABSTRACTS

COVID-19 is a unique variant of the Coronavirus Disease-19 virus. As of July 31, 2021, the world had verified 197,943,446 cases of COVID-19 and 4,222,934 associated causes of death, while Indonesia had confirmed 3,409,658 cases and 94,119 associated causes of death. COVID-19 symptoms can be classed as mild, moderate, or severe. Experts recommend the use of HFNC and NIV as a first-aid measure in patients with respiratory failure. HFNC is a nasal cannula that distributes 60 liters per minute of warm, moist air. The purpose of this study was to assess the oxygen saturation values of individuals with confirmed Covid 19 before and during treatment with a High Flow Nasal Cannula. The inquiry was conducted using a pre-experimental one-group pretest-posttest design. The study was done by measuring oxygen saturation before delivering HFNC therapy, followed by administering HFNC therapy and watching individuals for one hour. The sample size was twelve respondents. We used the paired-test parametric test to analyze univariate and bivariate data (dependent t-test). The average oxygen saturation value prior to and during HFNC treatment was 87.25 and HFNC administration was 91.33. The 0.000 p-values derived from bivariate data analysis revealed that HFNC oxygenation treatment is effective at increasing oxygen saturation. Hospitals should be able to extend health services and facilities in the critical care unit, notably additional HFNC devices to decrease the likelihood of patients being intubated.

Keywords*: COVID-19, HFNC, Oxygen Saturation*

1. Introduction

Coronavirus 2 (SARS-CoV-2) transmission between humans has resulted in 32,400 fatalities among the general population and 647 deaths among health staff in Indonesia (Purnomo, 2020). Around 5% of people who test positive with COVID-19 require intensive care. Between 71 and 90% of critical care unit patients require intubation and mechanical breathing (Raoof, Nava, Carpati, & Hill, 2020). Hypoxemic respiratory failure is the predominant symptom of severe COVID-19 coronavirus infection. Acute hypoxemia is characterized as prolonged shortness of breath while receiving oxygen at a rate of greater than 10-15 L/min via a reservoir-equipped face mask. In certain cases, a High Flow Nasal

Cannula (HFNC) is more effective than a low-flow oxygenator such as a Nasal Canul 1LT-6LT, a basic Mask 6LT-10LT, a Mask Rebreathing 8LT-12LT, or a Non-Rebreathing Mask 6LT-15LT.

Additionally, Continuous Positive Airway Pressure (CPAP) may be utilized in conjunction with a High Flow Nasal Cannula (HFNC) (CPAP). The use of NIV (noninvasive mechanical ventilation) may be advantageous (Procopio, 2020). It may be utilized as a first therapy for individuals with acute respiratory failure based on the advantages of HNFC and HFNC. Due to the fact that this is a novel therapy and the number of verified COVID-19 patients treated in the ICU was limited to 12, HFNC was initiated as the initial treatment for patients treated in the ICU. COVID-19 isolate action. The goal of this study is to assess the effectiveness of high-flow nasal cannula (HFNC) oxygen treatment against fluctuations in oxygen saturation in patients with confirmed COVID-19. The purpose of this study was to compare the oxygen saturation levels of participants who received and those who did not receive HFNC oxygenation treatment.

2. Methods

The study employed a pre-experimental one-group pretest-posttest design.

The study's independent variable was the efficacy of HFNC oxygenation treatment, whereas the dependent variable was changed in oxygen saturation. Twelve responders were randomly selected to join the COVID-19 isolation unit with severe symptoms and a 93 percent oxygen saturation. The data collection procedure included measuring and documenting the respondent's oxygen saturation before giving HNFC. It was observed after one hour of intervention, and the oxygen saturation level was then re-tested.

Data Analysis

Univariate analysis was used to evaluate oxygen saturation before and after HFNC treatment. Bivariate analysis was used to evaluate the difference in oxygen saturation between pre-and-post-HFNC treatment. The difference in oxygen saturation levels before and after HFNC oxygenation treatment was determined using a paired parametric test (dependent t-test).

3. Results

Univariate Analysis

Mean blood pressure in pre-elderly women with hypertension in the intervention group.

Table 1 Saturation of Oxygen Prior to HFNC Oxygen Therapy

Oxygen Saturation	N	Mean	SD	SE	Min-Maks
Pretest	12	87,25	1,357	0,392	85-89

Source: Primary Data 2021

Prior to undergoing HFNC oxygenation treatment, patients' average saturation level was 87.25, with a standard deviation of 1.357 and a range of 85 to 89.

The Effects of HFNC Oxygen Therapy on Oxygen Saturation.

Table.2 Following HFNC Oxygen Therapy, the Average Oxygen Saturation

Oxygen Saturation	N	Mean	SD	SE	Min-Maks
Post test	12	91,33	3,420	0,987	86-97

Source: Primary Data 2021

Patients' average oxygen saturation level was 91.33 with a standard deviation of 3,420 following HFNC oxygenation treatment.

The lowest and highest values were 86 and 97. COVID-19-positive patients.

Table .3 Differences in Average Saturation Prior to and Following HFNC Oxygen Therapy.

Oxygenation Saturation	N	Mean	SD	SE	Min-Maks	*p-value*
Pre test	12	87,25	1,357	0,392	85-89	0,000
Post test	12	91,33	3,420	0,987	86-97	

Source: Primary Data 2021

The average oxygen saturation level is 87.25 (pre-test) and 91.33 (post-test), as shown in Table 3. (post-test). With a p-value of 0.000, there was a significant difference in saturation between people with confirmed COVID-19 who underwent HFNC oxygen treatment and those who did not (0.05). Saturation values in patients with confirmed COVID-19 were significantly different before and after HFNC oxygen treatment.

4. Discussion

An oxygen saturation value is a measurement of the amount of oxygen in the blood that can be used to monitor the body's state or to assess whether a treatment is effective or should be re-evaluated. The oxygen saturation of the blood can be determined in two ways: via blood gas analysis (AGD) or with a pulse oximeter. Normal oxygen saturation ranges between 95% and 100%. Hypoxemia is a condition in which the oxygen saturation level is low. more effective than low-flow oxygenation because it can give high-flow oxygen with a flow capability of 30LT-60LT (Procopio, 2020). The critical factor in preventing the disease from progressing, particularly in COVID 19, is the use of a high-flow nasal cannula (HFNC) or noninvasive mechanical breathing (NIV).

It is recommended to use HFNC for one hour instead of NIV. Saturation values differ between confirmed Covid-19 patients who got HFNC oxygen treatment and those who did not. The HFNC is a customized nasal cannula capable of delivering a very high airflow rate of 60 liters per minute at temperatures up to 37'C, 100% humidity, and an inspired oxygen fraction (FiO2) of 0.21-1 percent, as well as titration of airflow velocity and FiO2 according to the patient's state (Leodeserto F, 2018). According to Vianello's study (2020), around 67.8 percent of patients with HFNC recovered and were able to be transferred to a regular room, 32.2 percent were unable to utilize HFNC and required NIV, and 17% required intubation. This increase in oxygenation is connected to appropriate ventilation, a high and stable FiO2, good upper airway clearance, positive pressure (PEEP), and the availability of warm, moist air. According to Vianello, patients with PaO2/FiO2 levels of more than 100 mmHg are at risk of failing to respond to HFNC treatment (2020).

5. Conclusions

The mean saturation level in patients before beginning HFNC oxygen treatment was 87.25 standard deviations (1,357). 85

and 89, respectively, were the minimum and maximum readings. After receiving HFNC oxygen treatment, the mean saturation level was 91.33 standard deviations (3,420). The lowest and highest values were 97 and 97, respectively. There was a significant change in saturation between before and after HFNC oxygen treatment, with a p-value of 0.000, in verified Covid-19 patients (0.05).

Reference

Alqahtani, J. S., Mendes, R. G., Aldhahir, A., Rowley, D., AlAhmari, M. D., Ntoumenopoulos, G., & et al. (2020). Global Current Practices of Ventilatory Support Management in COVID-19 Patients: An International Survey. Journal of Multidisciplinary Healthcare, 13: 1635-1648.

Duan, J., Chen, B., Liu, X., Shu, W., Zhao, W., Li, J., Wang, K. (2020). Use of high-flow nasal cannula and noninvasive ventilation in patients with COVID19: A Multicenter observational study. Amerian Journal of Emergency Medicine.

E. Hoffman, K. L. Reichmuth, and M. L. Cooke, "A review of the use of high-flow nasal cannula oxygen therapy in hospitalized children at a regional hospital in the Cape Town Metro, South Africa," South African Med. J., vol. 109, no. 4, pp. 272–277, 201

Guo, Z.-D., Wang, Z.-Y., Zhang, S.-F., Li, X., Li, L., Li, C., ... Chen, W. (2020) „Aerosol and Surface Distribution of Severe Acute Respiratory Syndrome Coronavirus 2 in Hospital Wards ", pp. 1–2.

J. Wang, K. P. Lee, S. L. Chong, M. Loi, and J. H. Lee, "High flow nasal cannula in the emergency department: indications, safety, and effectiveness," Expert Rev. Med. Devices, vol. 15, no. 12, pp. 929–935, 2018.

Kementerian Kesehatan RI (2020) Pedoman pencegahan dan pengendalian coronavirus disease (COVID-19) revisi ke-4 1.

Lim et al., 2020. Case of the Index Patient Who Caused Tertiary Transmission of Coronavirus Disease 2019 in Korea: the Application of Lopinavir/Ritonavir for the Treatment of COVID-19 Pneumonia Monitored by Quantitative RT-PCR. J Korean Med

Raoof, S., Nava, S., Carpati, C., & Hill, N. S. (2020). High-Flow, Noninvasive Ventilation and Awake (Noninubation) Proning in Patients With

Vianello, A., Arcaro, G., Molena, B., Turato, C., Sukthi, A., Guarnieri, G., & et al.

(2020). Highflow nasal cannula oxygen therapy to treat patients with hypoxemia acute respiratory failure consequent to SARS-CoV-2 infection. Thorax; 75, 9981000.

Wan, Y., Shang, J., Graham, R., S. Baric, R., Li, F. (2020) „cross Receptor Recognition by the Novel Coronavirus from Wuhan: an Analysis Based on Decade-Long Structural Studies of", (March), pp.1–