The outcome of oxygen therapy on desaturated patient with moderate to severe symptoms in Kogabwilhan II Indrapura Field Hospital

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ABSTRACT

Background: Since the first outbreak of Coronavirus Disease 2019 (COVID-19) in late 2019 in Wuhan, the SARS-CoV virus has grown rapidly and spread around the globe. The virus invades respiratory epithelium, causing inflammation and damage to lung cells, which causes impaired gas exchange and leads to a desaturated state. Kogabwilhan II Indrapura Field Hospital in Surabaya was an initial emergency hospital for asymptomatic and mild-symptomatic COVID-19 patients. Due to the massive surge of COVID-19 cases in East Java, it had to treat moderate and severe symptomatic patients.

Aim: The study aims to report clinical prognosis post-COVID-19 infection.

Method: This is a retrospective descriptive study in Kogabwilhan II Indrapura Field Hospital with desaturated COVID-19 patients from March 2020 to October 2021 as samples.

Results: Of 471 admitted COVID-19 patients with desaturation, 36.9% were moderate-symptomatic, and 63.9% had severe ones. All patients received oxygen therapy and multivitamins. Then, 29.7% of patients were cured, while 70.3% were referred. 48.4% of referred patients were pronounced deceased, and 11.7% were unknown.

Conclusion: Most patients declared cured after being referred to another center.

Keywords: COVID-19, Desaturation, Oxygen Demand.

INTRODUCTION

Coronavirus disease-19 (COVID-19) has been established as an agent responsible for the outbreak of a new coronavirus infection in Wuhan in late 2019. After the massive outbreak in China, the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) continues to spread around the world. In early April 2020, one of the highest COVID-19 cases was reported in the United States of America, followed by Spain, Italy, Germany, France, and China.1,3

SARS-CoV-2 is the causative agent of COVID-19 infection. SARS-Cov-2 virus is a capped virus with positive single-stranded RNA originating from the Coronavirus family.4 The respiratory tract is the most commonly affected by COVID-19 infection. Infection symptoms in the lungs usually have an early onset with more identifiable symptoms.5 The virus attacks respiratory epithelial cells. It enters the host cell through the ACE 2 receptor and replicates inside the cells, which causes inflammation and damages lung cells. This condition might lead to ARDS.6

The main pathophysiology of hypoxemia in COVID-19 patients is lung damage and multi-organ failure.7-11 Hypoxemia in COVID-19 happens due to decreased oxygen diffusion capacity by cause of alveolar-capillary wall thickening and microvascular thrombosis. The condition of severe ARDS might lead to impaired gas exchange caused by alveolar and interstitial edema, fluid accumulation in the alveoli, and impaired surfactant synthesis, which can also precipitate alveoli collapse.12,13

COVID-19 varies depending on the severity of the symptoms. COVID-19 patients who are both moderately and mildly ill with comorbidities must be treated in a hospital. Principally, treating moderately ill patients is symptomatic treatment and monitoring until the patient fulfills the criteria for discharge. Severely ill patients require early supportive therapy and intensive monitoring. Patients with severe ARI, respiratory distress, hypoxemia, and shock must receive oxygen supplements immediately. Patients with worsening clinical symptoms need intensive monitoring to carry out the appropriate treatment.
out immediate supportive treatment. Treatments for patients with comorbidities are adjusted to the comorbidities and their prognosis assessment. Fluid management is administered conservatively for patients with severe ARI without shock.\(^4\)

Kogabwilhan II Indrapura Field Hospital was an emergency hospital established to treat COVID-19 patients. The hospital was intended to treat COVID-19 patients without and with mild symptoms. All treated patients in this hospital were to receive symptomatic therapy, isolation, relaxation, nutrition, and oxygen (SIRNO). Symptomatic treatment was given according to the patient's symptoms. Isolations were provided by classifying patients into red zones in order to separate patients from healthcare workers in the hospital. An isolation zone for patients was facilitated with bedrooms, a designated room to rest, a garden, and other facilities for outdoor activities. It was also complemented with a fitness center, karaoke facility, religious activities, and breathing exercises for relaxation. Patients also received nutritional intake following their required nutrition. Each patient's progress was monitored every 3 hours by health workers on duty, and patients could receive counseling from health workers throughout the treatment regarding their inconveniences. Aside from the services mentioned above, patients with comorbidities also received therapy according to their comorbidities.\(^15\)

METHODS

This research is a retrospective study and involves patients declared positive for COVID-19 from the positive result of an RT-PCR test as well as those who experienced a decrease in SaO2 ≤ 95% in Kogabwilhan II Indrapura Field Hospital within the period time of March 2020 until October 2021 as samples. This research implemented secondary data as the research subject till the medical records available as many as 471. The data obtained included the patient's degree of severity, received therapy, and clinical outcomes. The data were developed using Microsoft Excel, then presented as frequency distribution tables and explained descriptively.

RESULTS

Desaturated patients in Kogabwilhan II Indrapura Field Hospital were dominated by patients with severe symptoms, as many as 301 patients (63.9%), whereas the number of patients with moderate symptoms was 170 (36.9%). All desaturated patients in this hospital only received therapy in the form of oxygen and multivitamins. One hundred forty patients (29.7%) had been improved from all admitted patients in the hospital, whereas the referral patients were 331 (70.3%). Of those 331 patients, 228 of them (48.4%) were cured, 48 patients (10.2%) are pronounced deceased, and 55 other patients (11.7%) are unknown (Table 1).

DISCUSSION

Most admitted COVID-19 patients, due to desaturation in Kogabwilhan II Indrapura Field Hospital (70.3%), had to be referred to other centers after undergoing treatment, while the additional 39.7% were pronounced cured. Of all patients referred to other centers, 48.4% of patients declared cured, 10.2% pronounced decreased, and others remain unknown.

All admitted patients in Kogabwilhan II Indrapura Field Hospital received SIRNO therapy. Initially, the hospital only treated patients without and with mild symptoms. Still, with the massive surge that led to overcapacity in other hospitals in East Java, the Kogabwilhan II Indrapura Field Hospital had to handle patients with moderate and severe symptoms. All desaturated patients treated in the Kogabwilhan II Indrapura Field Hospital had moderate to severe symptoms. However, the hospital used neither antiviral nor corticosteroid therapy at all.\(^13\)

Aggressive oxygen delivery was crucial in treating COVID-19 patients with hypoxia to reduce mortality and enhance patient recovery.\(^16\) Regardless of its cruciality, it must be taken into account that all oxygen delivery methods risk forming aerosol that can become a transmission source.\(^8\)

A study mentioned that glucocorticoid drugs increased the risk of clinical symptoms worsening into a severe state after being treated with glucocorticoids. In contrast, using antivirals was associated with less worsening of severe symptoms and lower mortality in COVID-19 patients at Wuhan Infectious Disease Hospital.\(^16\) It has not yet been proven whether antiviral agents can provide better outcomes in COVID-19 patients. It is in light of the fact there is still a lack of clinical trials to prove the effectiveness of using antiviral agents on COVID-19.\(^17,18\) Most COVID-19 infected patients were improved without receiving clinical intervention. The treatment must be considered so that COVID-19 patients do not receive excessive therapy.\(^19\)

CONCLUSION

The post-referral extensive treatment of Kogabwilhan II Indrapura Field Hospital has improved the desaturated COVID-19 patients with moderate to severe symptoms. Oxygen administration is crucial in terms of treating patients with respiratory distress. It is also acknowledged that most COVID-19 patients are well by themselves, and it can

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<tr>
<th>Table 1. Sample Characteristics</th>
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<tbody>
<tr>
<td><strong>Variables</strong></td>
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<tr>
<td><strong>Degree of Severity</strong></td>
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<tr>
<td>Moderate</td>
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<tr>
<td>Severe</td>
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<tr>
<td>Cured</td>
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<td><strong>Therapy</strong></td>
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<td>Multivitamin</td>
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<tr>
<td><strong>Referred Patients Outcome</strong></td>
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<tr>
<td>Cured</td>
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<tr>
<td>Deceased</td>
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Note: N/A: data are not available

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be said that therapy for patients needs to be given more attention so patients do not receive excessive treatment.

**CONFLICT OF INTEREST**

The authors declare that they have no competing interests.

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**AUTHOR CONTRIBUTIONS**

All authors contributed the synergical input, process, and output.

**ETHICAL CLEARANCE**

This research has received approval from the Health Research Ethics Committee of the Faculty of Medicine of Airlangga University.

**REFERENCES**