









Clinical Manifestations of COVID-19 Patients with Comorbid and Non-comorbid at Dr. Soetomo Hospital, Surabaya

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Abstract

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BACKGROUND: Coronavirus disease 2019 (COVID-19) has been declared a global health emergency. Reports of thousands of cases with morbidity and mortality continue to increase every day. The clinical course of patients with comorbidities influences the prognosis and progression of the COVID-19 disease. Hypertension is the most common comorbidity of COVID-19 patients with long hospitalizations.

AIM: This study aimed to determine the clinical differences between COVID-19 patients comorbid and non-comorbid.

METHODS: The study was conducted retrospectively through samples of medical records of inpatients for the period June 1, 2021–August 31, 2021. The samples were divided into comorbid and non-comorbid groups; each totaling 130 medical records. The sample of the comorbid group was selected by simple random; while the non-comorbid group with the matching process. Data were analyzed using t-test and Wilcoxon.

RESULTS: The most common comorbid is hypertension with clinical manifestations of cough, fever, headache, runny nose, painful swallowing, anosmia, shortness of breath, nausea, vomiting, and diarrhea. The average length of stay for patients with comorbidities was 21 days and without comorbidities 14 days. The test results showed that there were clinical differences between patients with comorbid and non-comorbid patients with $p = 0.0000$ ($p > 0.05$) and there was a difference in length of stay with $p = 0.001$ ($p > 0.05$).

CONCLUSION: The clinical difference between COVID-19 patients comorbid and non-comorbid lies in the symptoms of headache with a longer duration of treatment, which is 22 days. More intensive treatment and care is needed for COVID-19 patients with comorbid hypertension.

Introduction

Coronavirus disease 2019 (COVID-19) is a disease caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) virus which is currently endemic and has become a global pandemic [1]. The COVID-19 outbreak has been declared a global health emergency due to reports of thousands of cases and evidence of human-to-human transmission [2]. The COVID-19 pandemic has placed an unprecedented burden on the health system [3]. The COVID pandemic has not only burdened intensive care units with an influx of critically ill patients, but has also challenged the capacity of the health system to respond to the needs of non-severe patients who require the necessary examinations and treatment [4].

The mortality and morbidity rate of COVID continues to increase every day [5]. Based on data from the World Health Organization as of December 27, 2020, there were a total of 79,231,893

COVID-19 cases spread throughout the world with a total death of 1,754,574 people [6]. The COVID-19 Handling Task Force (2021) reported that as of January 3, 2021, data on the distribution of COVID-19 in Indonesia was 765,350 confirmed cases, 22,734 cases died, and 110,679 cases were active or under treatment. About 11.3% (86,361 cases) were confirmed in East Java Province and most of them came from Surabaya City (18,288 cases) [7]. The number of cases treated at Soetomo Hospital in Surabaya starting from March to July 2020 as many as 1432 cases. COVID-19 appears in varying degrees of severity [3]. Most cases of COVID-19 show mild symptoms and 50% of infected people are asymptomatic [8]. However, in about 20% of patients, the disease causes severe clinical consequences that require hospitalization and some cases require intensive care [9].

The patient's condition and the presence of comorbidities associated with the condition influence the prognosis and progression of COVID-19 disease [10]. That patients with advanced age,

diabetes mellitus, hypertension, low PaO₂/FiO₂ values, and delayed treatment are risk factors for a severe and fatal course of the disease [11]. Diseases such as hypertension, diabetes, respiratory system diseases, cardiovascular diseases, and susceptibility conditions can be associated with the pathogenesis of COVID-19 [12]. The current pandemic has also brought a new situation related to cardiovascular complications and comorbidities which mainly lead to hypertension and diabetes mellitus [13].

Preliminary clinical observations indicate that hypertension and diabetes mellitus are the main comorbidities in COVID-19 along with cardiovascular disease, chronic obstructive pulmonary disease (COPD), and malignancy [14]. Diabetic patients with COVID-19 infection have a higher risk of being admitted to the ICU during infection and a higher risk of death [15]. Hypertension is the most common cardiovascular comorbidity that appears to significantly increase the risk of death in COVID-19 patients [16]. Comorbidities of diabetes and hypertension are important risk factors for death with COVID-19 [14]. Chronic disease can result in infectious disorders, such as proinflammatory states and weakened innate immune responses [12]. The severe and fatal course of COVID-19 is associated with organ damage that primarily affects the heart, liver, and kidneys. Coagulation dysfunction can play an important role in organ damage [10]. Based on the above background, the researcher is interested in conducting a study with the title "Clinical Manifestations of COVID-19 Patients with Comorbid and Non-comorbid at Dr. Soetomo Hospital, Surabaya."

Methods

This study is an analytical study using a retrospective cohort design regarding the clinical relationship between COVID-19 patients with comorbid and without comorbid at Dr. Soetomo Hospital, Surabaya. This research has received ethical approval from the Ethics Committee of Dr. Soetomo Hospital. The sample in this study was obtained from medical records of inpatients at Dr Soetomo Hospital, Surabaya for the period June 1, 2021–August 31, 2021. The samples were divided into two groups, namely, groups with and without comorbid, where each sample consisted of 130 medical records. The sample of the comorbid group was selected using a simple random technique; while the non-comorbid group was selected by a matching process. The instrument or tool used in this research is a check list sheet which refers to the research concept framework. The data that have been obtained are then analyzed using t-test and Wilcoxon.

Results

Demographic data

Based on Table 1, it shows that the majority of COVID-19 patients with comorbidities are male (70.8%) with an age of more than 40 years (87.7%) with jobs other than health workers (66.2%) while demographic data for patients most of the COVID-19 non-comorbid are male (72.3%), with ages more than 40 years (69.2%) with the majority working as health workers (73.8%).

Table 1: Demographic data of COVID-19 patients with and without comorbidities

| No | Variable | Patients | | n (%) |
|----|----------------|---------------------|-------------------|------------|
| | | Comorbidities n (%) | Non comorbidities | |
| 1. | Gender | | | |
| | Man | 46 (70.8) | 47 (72.3) | 93 (71.5) |
| | Women | 19 (29.2) | 18 (27.7) | 37 (28.5) |
| 2. | Age (years) | | | |
| | < 12 | 2 (3.1) | 5 (7.7) | 7 (5.3) |
| | 12 – 29 | 5 (7.7) | 15 (23.1) | 20 (15.4) |
| | 30 – 40 | 1 (1.5) | 0 (0) | 1 (0.8) |
| | > 40 | 57 (87.7) | 45 (69.2) | 102 (78.5) |
| 3. | Occupation | | | |
| | Health workers | 22 (33.8) | 48 (73.8) | 70 (53.8) |
| | Others | 43 (66.2) | 17 (26.2) | 60 (46.2) |

Clinical manifestation

Based on Table 2, it can be seen the clinical course of COVID-19 patients with comorbidities with clinical headache, cough, fever, cough, fever, headache, flu like symptoms, swallowing pain, anosmia, shortness of breath, nausea, vomiting, and diarrhea. Clinical patients with non-comorbid include cough, fever, cough, fever, headache, flu like symptoms, swallowing pain, anosmia, shortness of breath, nausea, vomiting, and diarrhea. Based on the statistical analysis of the Wilcoxon test, it was obtained that the p = 0.000 was smaller than 0.05, which means that there is a significant difference between the clinical course of COVID-19 patients comorbid and non-comorbid.

Table 2: Clinical manifestation coronavirus disease 2019 patients comorbidities and non-comorbidities

| Number | Clinical manifestation | Patients | | Total, n (%) | p-value |
|--------|------------------------|----------------------|--------------------------|--------------|---------|
| | | Comorbidities, n (%) | Non-comorbidities, n (%) | | |
| 1 | Cough | 30 (13.3) | 28 (13.8) | 58 (13.5) | 0.000 |
| 2 | Fever | 30 (13.3) | 22 (10.8) | 52 (12.1) | |
| 3 | Headache | 65 (100) | 0 | 65 (100) | |
| 4 | Flu-like symptoms | 19 (8.4) | 23 (11.3) | 42 (9.8) | |
| 5 | Swallowing pain | 15 (6.6) | 19 (9.4) | 34 (7.9) | |
| 6 | Anosmia | 14 (6.2) | 7 (3.4) | 21 (4.9) | |
| 7 | Shortness of breath | 18 (8.0) | 2 (1.0) | 20 (4.7) | |
| 8 | Nausea | 8 (3.5) | 11 (5.4) | 19 (4.4) | |
| 9 | Vomiting | 16 (7.1) | 2 (1.0) | 18 (4.2) | |
| 10 | Diarrhea | 4 (1.8) | 8 (3.9) | 12 (2.8) | |
| 11 | Swab PCR | 29 (27.4) | 29 (30.6) | 58 (13.5) | |

PCR: Polymerase chain reaction.

Length of treatment

Based on the Table 3, it can be seen that the proportion of COVID-19 patients comorbidities was greater at 14–21 days of the treatment (92.3%) when compared to the length of the treatment of <7 days

Table 3: Cross tabulation of patient status with the length of the treatment for coronavirus disease 2019 patients

| Length of treatment (days) | Patients | | Total n (%) | Mean | SD | T | p-value |
|----------------------------|----------------------|--------------------------|-------------|------|------|------|---------|
| | Comorbidities, n (%) | Non-comorbidities, n (%) | | | | | |
| <7 | 3 (4.6) | 11 (16.9) | 14 (10.8) | 1.88 | 2.46 | 3.33 | 0.001 |
| 7–14 | 2 (3.1) | 54 (83.1) | 56 (43.0) | 2.97 | 3.48 | | |
| 14–21 | 60 (92.3) | 0 | 60 (46.2) | | | | |
| Total | 65 (100) | 65 (100) | 130 (100) | | | | |

SD: Standard deviation.

(4.6%). The proportion of patients non-comorbid was greater in the length of the treatment of between 7 and 14 days (83.1%) when compared to the length of the treatment of <7 days (16.9%). Based on the statistical analysis of the Wilcoxon test, the $p = 0.001$ was smaller than 0.05, which means that there is a significant difference between the length of the treatment for COVID-19 comorbid and non-comorbid.

Discussion

Demographic data of COVID-19 patients

Based on the results of the study, the majority of COVID-19 patients with comorbidities are male (70.8%) with an age of more than 40 years (87.7%) with jobs other than health workers (66.2%) while demographic data for patients most of the COVID-19 non-comorbid are male (72.3%), with ages more than 40 years (69.2%) with the majority working as health workers (73.8%).

This is in line with several studies of clinical characteristics of COVID-19 patients in Wuhan, Kuwait, and Jakarta where the majority of patients are men with an age range of 50–59 years. A total of 4 patients (8.3%) in this study worked as health workers, there was no mortality in patients who worked as health workers. A previous study in Wuhan noted that 40 people (29%) were exposed to COVID-19 and worked as health workers [17].

Men are more easily infected with coronavirus with a higher severity of male patients, this could be due to hormonal and immunological forms, as well as enzymes as viral receptors that are more commonly found in the male body. The enzyme in question is called angiotensin-converting enzyme 2 (ACE2) which is found in various people such as the heart, kidneys, lungs, and other organs and has been linked to the coronavirus, while in women, the ACE2 type of virus receptors tends to be fewer. The high level of ACE2 is thought to play an important role in the development of lung disorders related to COVID-19. Apart from internal enzyme problems, behavioral problems are also the cause of the number of men infected with COVID-19. As is known, maintaining a clean and healthy lifestyle (PHBS) is an important action that must be taken by everyone in an effort to prevent the transmission of

COVID-19, whose cases are still occurring throughout the world, including Indonesia. Women are much more compliant (health protocols and PHBS) than men.

With age, the body will experience various declines due to the aging process, ranging from decreased production of hair color pigments, hormone production, skin elasticity, muscle mass, bone density, tooth strength, and to the function of body organs. The immune system as a protector of the body does not work as strong as when it was young. This is the reason why the elderly (elderly) are susceptible to various diseases, including COVID-19 caused by the coronavirus. In addition, not a few elderly people have chronic diseases, such as heart disease, diabetes, asthma, or cancer. This can increase the risk or danger of coronavirus infection. Complications arising from COVID-19 will also be more severe if the patient already has these diseases.

The increasing number of patients and victims who died due to coronavirus infection in Indonesia continues to be a public concern. Not only the general public at risk of infection, medical personnel can also be exposed to the coronavirus. The lack of medical personnel is also a concern. In fact, not a few medical workers are actually exhausted and eventually become infected due to taking care of patients infected with the coronavirus.

Clinical manifestation COVID-19 patients

The results of the study obtained that the clinical results of patients with and without comorbid clinical symptoms were almost entirely the same, namely, cough, fever, headache, runny nose, painful swallowing, anosmia, shortness of breath, nausea, vomiting, and diarrhea, only in patients with comorbid hypertension almost all of them complained of headache.

This is in line with Grace's research (2020) which says that patients with COVID-19 have a fever with a temperature higher than 38°C. Patients also experience cough, fatigue, and muscle aches and patients with poor immunity will continue to have symptoms of shortness of breath [18]. A small number of patients also develop expectoration (28%), headache (8%), hemoptysis (5%), and diarrhea (3%), with elderly cases and those with comorbid disease and ARDS having a worse prognosis when infected with this virus. Common clinical symptoms that occur in COVID-19 patients include fever, dry cough, dyspnea, fatigue, muscle aches, and headaches [19]. Based on research conducted by Huang *et al.* (2020), the most common clinical symptoms in COVID-19 patients are fever (98%), cough (76%), and myalgia or weakness (44%). Other symptoms found in patients, but not so frequently found, were sputum production (28%), headache in 8%, coughing up blood in 5%, and diarrhea in 3% and 55% of the patients studied had dyspnea.

COVID-19 can affect anyone regardless of age or gender. COVID-19 is known to be more at risk

of attacking people with certain medical conditions. In this group, COVID-19 also tends to cause more severe complications and symptoms. COVID-19 easily attacks people with weak immune systems. The immune system of hypertensive patients is impaired due to high blood pressure. The problem of chronic hypertension, especially among the elderly, will weaken the immune system so that it is unable to deal with viral infections; therefore, people with high blood pressure are susceptible to being infected with the coronavirus that causes COVID-19.

Length of the treatment

The length of the treatment for COVID-19 patients with comorbidities was greater at 14–21 days of the treatment (92.3%) when compared to the length of the treatment of <7 days (4.6%). The proportion of patients non-comorbid was greater in the length of the treatment of between 7 and 14 days (83.1%) when compared to the length of the treatment of <7 days (16.9%).

According to the previous research, the incubation period for COVID-19 is between 3 and 14 days. Characterized by leukocyte and lymphocyte levels that are still normal or slightly decreased, the patient has not felt symptoms. Subsequently, the virus begins to spread through the bloodstream, mainly to ACE2-expressing organs and the patient begins to experience mild symptoms. Four to 7 days from the onset of symptoms, the patient's condition begins to deteriorate, characterized by the onset of dyspnea, decreased lymphocytes, and worsening of lung lesions. If this phase is not resolved, Acute Respiratory Distress Syndrome (ARSD), sepsis, and other complications can occur. Clinical severity is related to age (over 70 years), comorbidities such as diabetes, COPD, hypertension, and obesity [20], [21], [22], [23].

The incubation period for a person infected with the SARS-CoV-2 virus that causes COVID-19 is 14 days. During that time, the patient will start to feel sick around the 4th day after being infected with the coronavirus. Symptoms of pain felt by patients infected with the coronavirus, each person is different from mild, moderate, and very severe. All of these symptoms also affect the immune system and risk factors for comorbid diseases or comorbidities that the patient had before contracting the coronavirus, SARS-CoV-2. COVID-19 patients with severe comorbid conditions are immediately admitted to the negative pressure ICU, while patients with moderate and mild conditions will be treated in the regular ward. Patients with uncontrolled comorbidities will be treated with special monitoring on the 5th–6th days of the treatment because unpredictable conditions can occur, namely, more severe conditions. The patient was declared cured after two swab tests were performed and the results were negative. The length of the treatment from admission to being declared cured took 2 weeks for patients without

comorbid, and 3 weeks for patients with comorbid. The length of time that the patient is treated and recovered varies depending on the condition of each patient.

Conclusion

Clinically, patients comorbidities and non-comorbidities have almost the same clinical symptoms, namely, cough, fever, headache, runny nose, painful swallowing, anosmia, shortness of breath, nausea, vomiting, and diarrhea, except that patients with comorbid hypertension complain of headaches. The length of the treatment for COVID-19 patients with comorbidities is 14–21 days, while for non-comorbid patients, the length of the treatment is <7–14 days.

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Authors' Contribution

All authors contributed equally to the study conceptualization, methodology, article search, data analysis, writing, and editing of the manuscript. All authors approved the final version of the article.

Data Availability Statement

The datasets generated during and/or analyzed during the present study are available from the corresponding author on reasonable request.

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