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CHARACTERISTICS, CLINICAL MANIFESTATIONS, LENGTH OF HOSPITALIZATION AND NUTRITIONAL STATUS OF COVID–19 PATIENTS

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Abstract

Background: The disease that is endemic and has become a global pandemic is COVID-19 due to reports of thousands of cases. The pandemic is weighing on intensive care units with an influx of COVID-19 patients. The clinical manifestations of COVID-19 vary, diagnostic examinations and treatment are also experiencing dynamic developments. This study aims to provide an overview of the characteristics, clinical manifestations, length of treatment and nutritional status of COVID-19 patients who are hospitalized in the Isolation Room of Dr Soetomo Hospital Surabaya.

Methods: this study used a descriptive analytic cross-sectional method with inclusion criteria that were positive for COVID-19. The research data was obtained from 130 hospital medical records for the period June to August 2021. The collected data was then analyzed using SPSS version 25.

Results: The study found that men were more exposed to COVID-19 (71.5 %) and 70 % of patients worked as medical personnel. The age range of the majority of patients was more than 40 years (78.5 %). Clinical manifestations of COVID-19 patients were cough (44.6 %), fever (40 %), flu-like symptoms (32.3 %), painful swallowing (26.2 %), anosmia (16.2 %), shortness of breath (15.4 %), nausea (14.6 %), vomiting (13.8 %), and diarrhea (0.9 %). The average length of stay is 7-14 days (9.2 %) with adequate nutritional status (14.6 %).

Conclusion: The majority of COVID-19 sufferers are male, over 40 years old, with cough symptoms, and the most comorbid hypertension, as well as deaths from hypertension and the elderly. Better treatment is needed for people with COVID-19.

Key words*: covid-19; characteristics, clinical manifestations; length of treatment; nutritional status.*

Background

Coronaviruses are a large family of viruses that cause disease. There are at least two types of coronaviruses that cause disease causing severe symptoms such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The corona virus spreads faster even though the risk of death is not as big as SARS (transmitted from civet cats) let alone MERS (transmitted from camels). Sars-CoV-2 is the virus that causes Corona Virus Disease (COVID-19). [1]with rapidly increasing demand for healthcare in hospitals and intensive care units (ICUs

The number of confirmed cases of Coronavirus Disease 2019 (COVID-19) continues to rise in several countries. According to the latest data on August 9, 2020 from the World Health Organization (WHO) there are 216 countries with confirmed cases of Coronavirus Disease 2019 (COVID-19) with the number of confirmed cases of Coronavirus Disease 2019 (COVID-19) 19,462,112 people.[2] with rapidly increasing demand for healthcare in hospitals and intensive care units (ICUs Until now, the country that occupies the highest position in the world for confirmed cases of the coronavirus disease 2019 (COVID-19) is the United States with a total of 4,897,958 people.[2]with rapidly increasing demand for healthcare in hospitals and intensive care units (ICUs 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, 11.3% (86,361 cases) were confirmed in Indonesia. East Java Province and most of them came from Surabaya City (18,288 cases).[3] The number of cases treated at RSUD dr. Soetomo Surabaya starting from March-July 2020 as many as 1,432 cases (Medical Record Data at Dr. Soetomo Hospital Surabaya, 2020). Covid-19 appears in varying degrees of severity. [4]

Symptoms of COVID-19 are often non-specific. Common symptoms that often appear include fever, cough and fatigue, which then recover quickly or progress to respiratory problems such as: shortness of breath, dyspnea, and pneumonia, causing ARDS, kidney failure, coagulation dysfunction, multiple organ

failure and even death. Another rare symptom. Symptoms include pain, nasal congestion, sore throat, headaches and even loss of the sense of smell or taste. [5]

Patients with COVID-19 require hospitalization because this disease is an infectious disease in the respiratory tract that is contagious and can cause respiratory, physical, and psychological dysfunction, as well as various other dysfunctions, the impact of which can reduce the patient's functional capacity. Patients with COVID-19 who require hospitalization are divided into two rooms, namely the ordinary treatment room and the intensive care room. [6]

Various nutritional interventions, such as oral nutritional supplements (ONS), dietary management and counselling, have shown positive results in different patient populations. For example, in hospitalized malnourished patients, nutritional interventions have been shown to reduce length of stay and rates of unplanned 30-day re-admissions, while improving quality of life and saving costs. A recent study showed that a comprehensive nutrition-focused quality improvement program in malnourished hospital inpatients reduced health care costs by reducing 30-day re-admissions and reducing length of stay. [7]

Efforts to stop COVID-19 must have two aspects: the first is the treatment of infected patients and avoiding the spread of the virus. This study aims to analyze the relationship between the characteristics, clinical manifestations, length of stay and nutritional status of COVID-19 patients with the severity of COVID-19 disease. It is hoped that by knowing the significant relationship between characteristics, clinical manifestations, length of stay and nutritional status with the severity of COVID-19, patients will receive optimal therapy, thereby reducing mortality. [9]

Method

This study uses a cross-sectional observational-analytic study conducted at Dr Soetomo Hospital Surabaya from June to August 2021 with existing medical records. The inclusion criteria of this study were all confirmed COVID-19 patients or real-time Polymerase Chain Reaction (RT-PCR) or by the GeneXpert SARSCoV-2 method with samples taken from nasal or pharyngeal swabs. All patients were treated in the Isolation Room of Dr Soetomo Hospital, Surabaya. This research has passed ethical standards from the ethics committee of Airlangga University faculty of dental medicine, number: 732/HRECC.FODM/VII/2021

Statistical analysis using SPSS version 25. Categorical data are presented in terms of frequency and percentage with Chi-Square test and Fischer exact test as alternative tests. Meanwhile, numerical data is presented in the form of mean ± standard deviation with independent T-test and Mann-Whitney test as alternative tests.

Results

1. Patient characteristics

Table 1

Characteristics of Covid-19 patients at Soetomo Hospital Surabaya, Indonesia

Variable	Severity		P value
	Heavy	Not heavy	
Gender			0,040
Man	47 (36,2%)	31 (23,8%)	
Woman	27 (20,8%)	25 (19,2%)	
Age (years)			0,149
< 12	2 (1,5%)	4 (3,1%)	
12 – 29	18 (13,8%)	17 (13,2%)	
30 – 40	12 (9,2%)	6 (4,6%)	
> 40	36 (27,7%)	35 (26,9%)	
Profession			0,302
Health workers	40 (30,8%)	38 (29,2%)	
Other	37 (28,5%)	15 (11,5%)	
Smoke			0,001
Exposed	39 (30%)	14 (10,8%)	
Tidak	35 (26,9%)	42 (32,3%)	

Based on table 1 obtained 130 patients who are willing and have signed the informed consent. The results showed that men were more at risk of experiencing COVID-19 with severe symptoms compared to women (P = 0.040; OR = 2.201; 95% CI = 0.992-4.876). Age did not correlate with the severity of COVID19 (P=0.149; OR=1.152; 95% CI=0.432-2.182). Occupation also had no effect on the severity of COVID-19 (P=0.302; OR=0.714; 95% CI=0.325-1.571). Patients who were exposed to cigarette smoke (active smokers, former smokers and passive smokers) had a higher chance of getting COVID-19 with severe symptoms compared to those who were not exposed to cigarette smoke (P=0.001; OR=13,440; 95% CI=4,250-42.502).

2. Clinical Manifestations

Based on table 2, the results of the clinical manifestations of COVID-19 patients assessed include a history of cough, not correlated with the degree of severity (P = 0.435; OR = 1.325; 95% CI = 0.5763.175). Symptoms of fever did not correlate with the degree of severity (P=0,620; OR=1,289; 95% CI=0,4433,750). Patients with severe symptoms tended to experience headaches that correlated with severity (P=0.011; OR=9.574; 95% CI=1.17777.865). Flu symptoms did not correlate with severity (P=0,347; OR=1,823; 95% CI=1,528-2.172). Patients with severe symptoms tended to experience painful swallowing (P=0.249;

OR = 1.815; 95% CI = 1.535-2.209). Complaints of anosmia did not correlate with the degree of severity (P = 0.293; OR = 2.588; 95% CI = 0.497-13.481). Patients with severe symptoms tend to experience symptoms of shortness of breath with a degree of severity (P = 0.001; OR = 9.286; 95% CI = 3.476-24.805). Complaints of nausea did not correlate with the degree of severity (P = 1,000; OR = 0,800; 95% CI = 0,108-5,909). Symptoms of vomiting did not correlate with severity (P = 0,157; OR = 0,1856; 95% CI = 0,781-4,409). Symptoms of diarrhea did not correlate with the degree of severity (P = 0.504; OR = 0.617; 95% CI = 0.154-2.441).

Table 2

Clinical manifestations of Covid-19 patients at Soetomo Hospital Surabaya, Indonesia

Variable	Severity		P value
	Heavy	Not heavy	
Clinical manifestation			
Cough	49 (37,7%)	38 (29,2%)	0,435
Fever	43 (33,1%)	36 (27,7%)	0,620
Headache	38 (29,2%)	2 (1,5%)	0,011
Flu-like Symptoms	31 (23,8%)	28 (21,5%)	0,347
Swallowing pain	8 (6,2%)	2 (1,5%)	0,249
Anosmia	5 (3,8%)	3 (2,3%)	0,293
Shortness of breath	64 (49,2%)	22 (16,9%)	0,001
Nausea	21 (16,2%)	11 (8,5%)	1,000
Vomiting	19 (14,6%)	9 (6,9%)	0,157
Diarrhea	8 (6,2%)	10 (7,7%)	0,504
Cormobid			
Cormobid	49 (37,7%)	28 (21,5%)	0,002
Non Cormobid	28 (21,5%)	38 (29,2%)	

Patients with comorbidities tended to experience severe symptoms compared to patients without comorbidities (P = 0.002; OR = 3.518; 95% CI = 1.494-7.705). Most of the comorbidities were hypertensive patients.

3. Length of treatment and nutritional statusLama perawatan dan status gizi

Based on table 3, it can be assessed that the length of treatment correlates with the degree of severity (P = 0.01; OR = 13,220; 95% CI = 4,250-42.502). Patients with poor nutritional status tend to experience severe symptoms compared to patients with adequate nutritional status (P = 0.000; OR = 3.216; 95% CI = 1.2929-6.604.

Discussion

The results of this study found that men were more exposed to COVID-19 (71.5%) where men were more at risk of experiencing COVID-19 with severe symptoms compared to women (P = 0.040; OR = 2.201; 95% CI = 0.992-4.876). This is in line with Liu et al who found that gender was mostly found in 56 males (55.4%) and 45 females (44.6%). [10] According to Ahmed and Dumanski, 2020 this could be due to the enzyme angiotensin 2 (ACE2), which is an integral part of the human renin-angiotensin-aldosterone system (RAAS), is a functional receptor that allows SARS-CoV-2 to attack human alveolar epithelial cells. Overall, males show greater RAAS activity than females. [11]

In this study, the mean age of severity was above 40 years (78.5%). This is in accordance with Lian et al who stated that the average age was 56 years. [12] Liu et al stated that the mean age of patients with severe and critical grades was higher than that of moderate grades. This is in line with this study where the average age of severe and critical patients was 60 and 56. [10] According to Wu et al, this may be due to a decrease in the immune system in old age so that they have a greater risk of ARDS and death. [13]

Table 3

Length of treatment and nutritional status of Covid-19 patients at Soetomo Hospital Surabaya, Indonesia

Variable		Severity		P value
		Heavy	Not heavy	
Length of treatment (days)				
	< 7	8 (6,2%)	6 (4,6%)	0,001
	7 – 14	12 (9,2%)	14 (1,1%)	
	14 – 21	64 (49,2%)	26 (20%)	
Nutritional status				0,000
	Moderate	19 (14,6%)	21(16,2%)	
	Several	20 (15,4%)	17 (13,1%)	
	Critical	37 (28,5%)	16 (12,3%)	

From our research data, it was found that 70% of patients worked as medical personnel and 20.75% did not work. According to The Centers for Disease Control and Prevention (CDC), the working age group is more susceptible to exposure, because to work, some people have to travel and meet many people. This is related to close contact and history of travel to infected areas which are risk factors for COVID-19 exposure. [14,15] However, in our study, it was found that there was no significant association between the working group of patients and the risk of exposure to COVID-19.

On smoking status, this study classified patients based on who was exposed (28.13%) and not exposed to cigarettes and found that 18 of 20 patients were in the severe category. This study is in line with the study of Kozak et al which stated that smoking status was related to the severity of the disease in patients treated in intensive care. [16] Another study by Hu et al stated that smoking status was related to the severity and mortality of COVID-19 patients.13 Another meta-analysis study by Zhao et al. stated that smoking increases the risk of COVID-19 severity by twofold. [17]

Based on clinical symptoms, the most common symptoms were cough (44.6%), fever (40%), flu-like symptoms (32.3%). In patients with severe symptoms, shortness of breath, fever, and cough are predominant. This is similar to the symptoms of COVID-19 pneumonia in China which show prominent symptoms in patients with severe pneumonia. [18]

In this study, 23 patients with comorbid hypertension (30.7%) were found to have a moderate degree, 8 people (47.1%) to a severe degree and 12 people (66.7%) to a critical degree. Other investigators Hu et al also concluded that the most common comorbidities among COVID-19 patients with ARDS were hypertension (27%), diabetes (19%) and cardiovascular disease (6%). [19] Sim et al in their study also found hypertension in mild COVID-19 13% and severe degrees 48.6%. [20] Huang et al found that 36.5% of COVID-19 patients with hypertension and hypertensive patients with COVID-19 tended to show a higher mortality rate. [21] This is also supported by Liang et al, hypertension is significantly associated with independent risk for predicting the severity and mortality of COVID-19 patients. [12] This according to Zhang et al can be caused by direct injury mediated through the angiotensin converting enzyme 2 (ACE2). A study in China showed that SARS-CoV-2 infection was caused by the binding of viral proteins to the ACE2 receptor after protein activation. ACE2 is a monocarboxy peptidase that is best known for cleaving several peptides in the renin-angiotensin system. Since its discovery in 2000, ACE2 has been considered a protective factor against elevated blood pressure. Binding of SARS-CoV-2 to ACE2 can reduce the physiological function of ACE2, and then lead to adverse outcomes of hypertension such as multi-organ dysfunction. [12] In addition, according to Cuba et al., ACE2 plays an important role in acute lung disease, especially acute respiratory distress syndrome. [22] Meanwhile, according to Rodila et al, hypertension is associated with a higher risk for all-cause mortality. [23]

In this study, the average length of stay was 7-14 days. The incubation period for people infected with the SARSCoV2 virus that causes Covid19 is 14 days. In patients with severe and critical COVID-19, intravenous insulin should be the first line of treatment. Patients who are on continuous renal replacement therapy (CRRT), the proportion of glucose and insulin in the replacement solution should be increased or decreased according to the results of monitoring glucose levels to avoid hypoglycemia and severe glucose fluctuations. During this period, the patient feels sick about 4 days after being infected with the coronavirus. Pain symptoms in patients infected with the coronavirus vary from mild, moderate to severe, depending on the person. All of these symptoms also affect the immune system and risk factors for comorbidities or comorbidities that the patient had before being infected with the SARSCoV2 coronavirus.[27] Covid19 patients with severe comorbidities are immediately admitted to the negative pressure intensive care unit, and patients with moderate to mild medical conditions are treated in the usual ward. Patients with uncontrolled comorbidity will have special monitoring on days 5 and 6 of treatment. This is because unpredictable conditions, or more severe conditions, can occur. After two swab tests, the patient was declared cured and the result was negative. The duration of treatment from admission to the declaration of cure was 2 weeks for patients without Cormobid and 3 weeks for patients with Cormobid. Treatment duration and patient recovery depend on each patient's condition. [24]

In this study, the average nutritional status of the patients was adequate. This is especially noticeable in bedridden patients with inadequate food intake. Therefore, nutritional support for patients with severe COVID 19 is extremely important and can improve the immune response to infection and thus the prognosis of the disease. COVID19 is a highly contagious disease, and severely ill patients usually exhibit other organ dysfunction and are prone to malnutrition. Appropriate nutritional intervention can prevent an increase in the incidence of multiple organ failure in time. The results of this retrospective study show that nutritional risk screening is an important basis for clinical management and prognostic assessment of COVID-19. The results of the study are in line with the research of Yu et al in 2021, comparing COVID-19 patients without malnutrition with COVID-19 patients with malnutrition, the results of the study show that COVID-19 patients with malnutrition have a longer stay in hospital than COVID-19 patients without malnutrition. [25] Proper diet and good nutritional status are

considered as essential elements for an optimal immune response to prevent infection. Nutritional status and diet modulate inflammation and immune function and influence the outcome of COVID-19. The nutritional status of the host is considered a key factor in the outcome of various infectious diseases. [26-28]

Conclusion

The results showed that clinical characteristics such as gender, smoking history, clinical manifestations (fever, shortness of breath and cough), length of stay and nutritional status had a significant effect on the severity of COVID-19 infection. Knowing the severity of the disease, it is hoped that patients will receive optimal therapy and reduce mortality.

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Conflicts of interest:

All authors — none to declare.

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