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Profile and Clinical Character of COVID-19 Patients at Zahirah Hospital, South Jakarta

(Profil dan Karakter Klinis Pasien COVID-19 di Rumah Sakit Umum Zahirah, Jakarta Selatan)

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ABSTRACT

Background: The rapid spread of COVID-19 makes people anxious and afraid of this outbreak. The government has implemented policies to prevent the spread of the corona virus. One of the implementations is Large-Scale Social Restrictions. This condition causes a considerable impact on several sectors, especially health, economy and education. **Objectivity**: this study was to determine the characteristics of COVID-19 patients receiving treatment at Zahirah General Hospital. **Material and methode**: Methode of the research is observational with a cross sectional design with a total sample of 328. **Result:** The results showed that the most cases of COVID-19 occurred at the age Late seniors (43%), male sex as much as 52%, experiencing fever (97%), the most comorbid disease was diabetes as much as 56%, treatment carried out by giving antivirals+supplements (79%), all patients were given supplements in the form of: Acetylcysteine, Vitamin C, B-complex, Zinc, Vitamin D. Avigan/ favipiravir was the most widely used antiviral (42%), the length of time the patient was treated for 14-21 days (41%), All COVID-19 patients with comorbidities show lymphocyte levels that are lower than normal limits. **Conclusion**: Late seniors, men are more susceptible to COVID-19 infection, diabetes is the comorbid disease that causes death and the most severe COVID-19 symptoms, and all COVID-19 patients with comorbidities have lower lymphocyte levels

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ABSTRACT

Background: The rapid spread of COVID-19 makes people anxious and afraid of this outbreak. The government has implemented policies to prevent the spread of the corona virus. One of the implementations is Large-Scale Social Restrictions. This condition causes a considerable impact on several sectors, especially health, economy and education. **Objectivity**: this study was to determine the characteristics of COVID-19 patients receiving treatment at Zahirah General Hospital. **Method:** of the research is observational with a cross sectional design with a total sample of 328. **Result:** The results showed that the most cases of COVID-19 occurred at the age Late seniors (43%), male (52%), experiencing fever (97%), the most comorbid disease was diabetes (56%), treatment carried out by giving antivirals+supplements (79%), all patients were given supplements in the form of: Acetylcysteine, Vitamin C, B-complex, Zinc, Vitamin D. Avigan/ favipiravir was the most widely used antiviral (42%), the length of time the patient was treated for 14-21 days (41%), All COVID-19 patients with comorbidities show lymphocyte levels that are lower than normal limits. **Conclusion**: Late seniors, men are more susceptible to COVID-19 infection, diabetes is the comorbid disease that causes death and the most severe COVID-19 symptoms, and all COVID-19 patients with comorbidities have lower lymphocyte levels.

Key words : Antiviral, COVID-19 , Favipivar, Clinical Characteristics, Remdesivir

ABSTRAK

Latar belakang: Penyebaran COVID-19 yang cepat membuat masyarakat cemas dan takut akan wabah ini. Kebijakan telah dilakukan pemerintah untuk mencegah penyebaran virus corona-19. Salah satunya penerapannya adalah Pembatasan Sosial Berskala Besar. Kondisi ini menyebabkan dampak yang cukup besar pada beberapa sektor terutama Kesehatan, ekonomi dan pendidikan. **Tujuan** penelitian ini untuk mengetahui karakteristik pasien COVID-19 menerima pengobatan di RSU Zahirah. **Metode** penelitian ini observasional dengan desain cross sectional dengan jumlah sampel sebanyak 328. **Hasil** penelitian menunjukkan bahwa kejadian COVID-19 paling banyak terjadi pada usia 56-65 tahun (43%), jenis kelamin laki-laki (52%), mengalami demam (97%), penyakit penyerta yang paling banyak adalah diabetes (56%), pengobatan dilakukan dengan pemberian antivirus+suplement (79%), seluruh pasien diberikan supplement berupa : Acetylcysteine, Vitamin C, B-complex, Zinc, Vitamin D. Avigan/ favipiravir merupakan antivirus yang paling banyak digunakan (42%), lama pasien dirawat selama 14-21 hari (41%), Seluruh pasien COVID-19 dengan penyakit penyerta menunjukkan kadar Limfosit yang lebih rendah dari batas normal. **kesimpulan** Usia lansia akhir, laki-laki lebih rentan terinfeksi COVID-19, diabetes merupakan penyakit penyerta yang paling banyak menyebabkan kematian dan keparahan COVID-19 serta seluruh pasien COVID-19 yang memiliki penyakit penyerta mengalami penurunan kadar limfosit.

Kata kunci: Antivirus, COVID-19 , Favipivar, Karakteristik Klinis, Remdesivir

INTRODUCTION

At the end of 2019, WHO reported an unusual incidence of pneumonia in the community in Wuhan City, China. After a metagenomic analysis was carried out by researchers at the Institute of Virology in Wuhan, it was found that there was an infectious new virus named novel coronavirus 2019 (nCoV-2019) or better known as COVID-19 (WHO, 2020b).

The high enough human-to-human transmission process caused this virus to quickly spread to various countries, including Indonesia, from what initially became an outbreak in Wuhan, Hubei Province, China. Until recently, SARS-CoV-2 was believed to be transmitted through droplets released when an infected person sneezes or coughs and makes contact. The droplets can then be inhaled directly through the respiratory tract or enter the respiratory tract through hands that have been exposed to the virus due to contact with virus-infected surfaces (Setiadi *et al.*, 2020).

WHO has declared the Corona virus as a global pandemic. According to WHO data as of July 28, 2021, the number of COVID-19 patients in the world reached 3,839,816,037 with 196,553,009 confirmed active cases and 4,200,412 deaths. The highest number of cases in the world is in America with a total of 76,788,166 cases (WHO, 2020a).

According to Public Health Emergency Operating Center (PHEOC) The Indonesian Ministry of Health as of July 14, 2021, there was an increase in 2,670,046 positive COVID-19 cases with 2,157,363 positive recovered cases and 69,210 positive COVID-19 deaths. In other words, the increase in positive cases of COVID-19 in Indonesia for 1 year was 91.38%.(Pusat data dan Informasi Kementrian kesehatan, 2021).

Based on the data above, the spread of COVID-19 is extremely rapid, making people anxious and fearful of the outbreak. Several policies have been carried out by the government to prevent the spread of the corona virus. One of them is by imposing the implementation of PSBB (Large-Scale Social Restrictions) in several areas. This condition causes a considerable impact on several sectors of society, especially in the health, economic and education sectors. The increase in the number of cases infected with COVID-19 and its mortality, followed by an increase in the use of antivirus on treatment of COVID-19 patients, encouraging research to be carried out to find out the clinical picture of COVID-19 patients at Zahirah Hospital, South Jakarta.

MATERIAL AND METHODS

METHODS

This study is a retrospective observational study using medical record data of COVID-19 patients treated at Zahirah Hospital during April 2020-April 2021.

The inclusion criteria were medical record from patients with a positive diagnosis of COVID-19 through positive oropharyngeal and nasopharyngeal PCR swab screenings who received inpatient treatment and had a complete medical history. The exclusion criteria were incomplete medical record.

The basic characteristics observed were age, gender, complaints, comorbidities, treatment therapy, length of stay and laboratory test results

RESULTS AND DISCUSSION

Indonesia is one of the countries with a high COVID-19 incidence and mortality rate. Jakarta, the nation's capital, can be used to illustrate the spread and management of the COVID-19 pandemic in Indonesia. Indonesia is one of the countries with a high COVID-19 incidence and mortality rate. Jakarta, the nation's capital, can be used to illustrate the spread and management of the COVID-19 pandemic in Indonesia.

Table 1. Basic Characteristics of COVID-19 Patients

Characteristics	Variable	(n)328	%
Age	Toddler (0-5 years old)	11	3
	Children (5-11 years old)	3	1
	Early teens (12-16 years old)	3	1
	Late adolescence (17-25 years)	33	10
	Early adulthood (26-35 years old)	42	13
	Late adulthood (36-45 years)	40	12
	Early elderly (46-55 years old)	55	17
	Late seniors (56-65 years old)	141	43
Gender	Woman	157	48
	Man	171	52
Patient Condition	Healed	248	76
	Refer	31	9
	APS	23	7
	Death	26	8
	Fever	317	97
	No Fever	11	3

Symptom	Cough	186	57
	No cough	142	43
	Have a cold	180	55
	No colds	148	45
	Diarrhea	164	50
	No diarrhea	164	50
Disease history	No co-morbidities	132	60
	With co-morbidities	196	40
Treatment	Antivirus+supplements	260	79
	No antivirus + supplements	68	21

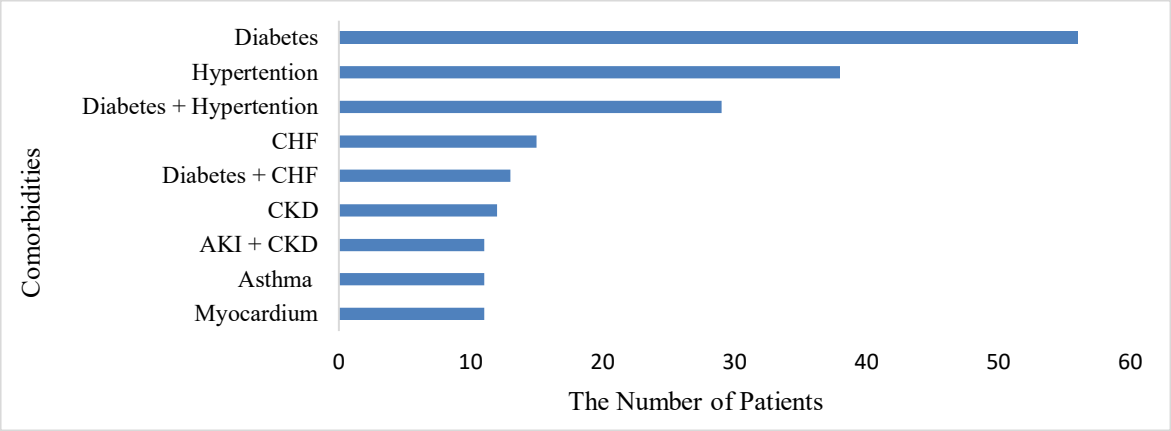

Figure 1. History of Concomitant Diseases of COVID-19 Patients

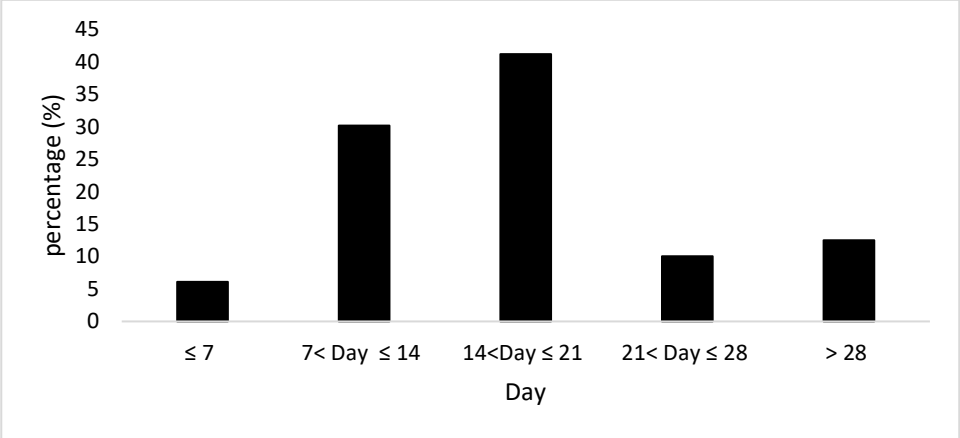

Figure 2. Length of Stay

All COVID-19 Patients, Both Those Receiving Antiviral Treatment And Those Not Receiving Antiviral Treatment, Were Given Food Supplements, Namely: Acetylcysteine, Vitamin C, Zinc, Vitamin D, Multivitamins. The Treatment Given To The Patient Is Presented In Figure 3.

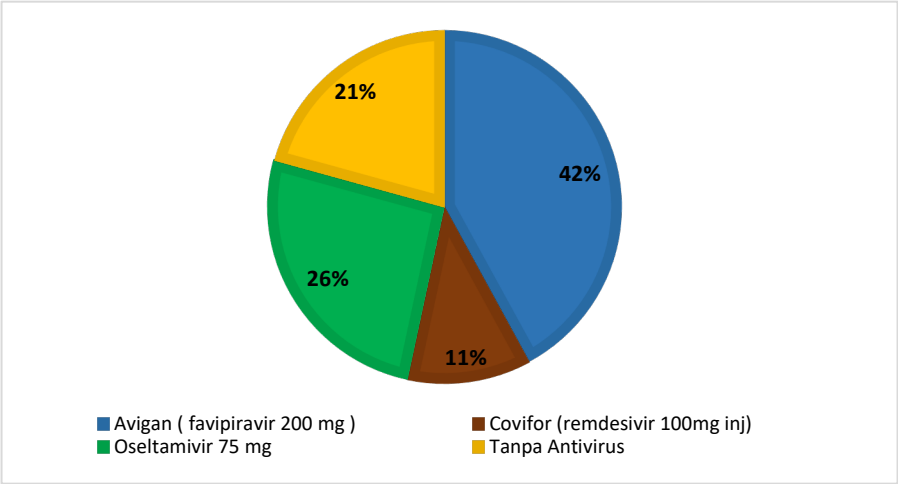

Figure 3. Treatment of COVID-19 Patients

Table 2. Laboratory profile of COVID-19 patients with comorbidities

Types of comorbidities	Inspection	Normal Limit	Average value
CHF	Hemoglobin	12-14g/dL	14.64g/dL
	Hematocrit	37-43%	41.92%
	Leukocytes	5-10 thousand/µL	7.78 thousand/µL
	Platelets	150-440 thousand/µL	170.4 thousand/µL
	Lymphocytes	25-40%	35.4%
Diabetes	Hemoglobin	12-14g/dL	13.86g/dL
	Hematocrit	37-43 thousand/µL	38.32 thousand/µL
	Leukocytes	5-10 thousand/µL	8.92 thousand/µL
	Platelets	150-440 thousand/µL	236.54 thousand/µL
	Lymphocytes	25-40%	15.8%
	GDS	<140 mg/dL	323.22 mg/dL
Diabetes + CHF	Hemoglobin	12-14 g/dL	13 g/dL
	Hematocrit	37-43%	35.83%
	Leukocytes	5-10 thousand/µL	12.1 thousand/µL
	Platelets	150-440 thousand/µL	228.67 thousand/µL
	Lymphocytes	25-40%	5.33%
	GDS	<140mg/dL	257.33mg/dL
Hypertension	Hemoglobin	12-14g/dL	13.76g/dL
	Hematocrit	37-43%	39.04%
	Leukocytes	5-10 thousand/µL	7.84 thousand/µL
	Platelets	150-440 thousand/µL	264.34 thousand/µL

CKD	Lymphocytes	25-40%	21.03%
	Hemoglobin	12-14g/dL	12.8g/dL
	hematocrit	37-43%	37.2%
	Leukocytes	5-10 thousand/µL	8.6 thousand/µL
	Platelets	150-440 thousand/µL	160.5 thousand/µL
	Lymphocytes	25-40%	13.5%
Diabetes-Hypertension	Hemoglobin	12-14 g/dL	12.94 g/dL
	hematocrit	37-43%	37.19%
	Leukocytes	5-10 thousand/µL	9.28 thousand/µL
	Platelets	150-440 thousand/µL	239.22 thousand/µL
	Lymphocytes	25-40%	22.89%
	GDS	<140 mg/dL	256.78mg/dL
Miocard	Hemoglobin	12-14g/dL	14.5g/dL
	Hematocrit	37-43%	43.8%
	Leukocytes	5-10 thousand/µL	8.5 thousand/µL
	Platelets	150-440 thousand/µL	269 thousand/µL
	Lymphocytes	25-40%	12%
Asthma	Hemoglobin	12-14g/dL	15g/dL
	hematocrit	37-43%	44.2%
	Leukocytes	5-10 thousand/µL	5.1 thousand/µL
	Platelets	150-440 thousand/µL	240 thousand/µL
	Lymphocytes	25-40%	16%
AKI +CKD	Hemoglobin	12-14g/dL	7.5g/dL
	hematocrit	37-43%	20.8%
	Leukocytes	5-10 thousand/µL	17.3 thousand/µL
	Platelets	150-440 thousand/µL	395 thousand/µL
	Lymphocytes	25-40%	20%

Description: CHF : Congestive Heart Failure, CKD : Chronic Kidney Disease, AKI : Acute Kidney Injury, GDS: Temporary Blood Sugar

Based on Table 1 age characteristics, patients in the late elderly category have the largest percentage of cases of COVID-19 cases compared to other age categories, which is 43%, where the cases treated are more in patients over 56 years to 65 years, this shows that people Elderly people are more susceptible to infection than young people, This is due to a decrease in the immune response to viral invasion into the body in old age, making them more susceptible to virus infection, and the presence of comorbidities or comorbidities possessed by late elderly patients can worsen the disease that causes elderly patients further, they must receive intensive care in a hospital. These results are reinforced by the high number of patients with comorbidities such as diabetes mellitus, hypertension, heart disease, kidney failure and other lung diseases that commonly occur in elderly patients. These results are also in line with studies

showing that patients aged 65 years and over and having a history of comorbid diseases such as diabetes and hypertension are admitted to the ICU (Wang D et al. 2020).

Based on In Table 1 gender characteristics, it shows that men have a greater percentage of cases of COVID-19 incidence (52%) compared to cases in women (48%). This is influenced by the presence of the androgen receptor (AR) gene that is owned by men (McCoy *et al.*, 2021), this receptor is a promoter of enzymes known to be involved in the infectivity of SARS-CoV-2 and TMPRSS2 (Wambier and Goren, 2020)(Wambier *et al.*, 2020), so that the increased activity of TMPRSS makes it easier for RNA from the virus to enter host cells and exacerbates COVID-19 cases experienced by men. This result is in accordance with several studies showing the number of COVID-19 patients receiving inpatient treatment is more male than female (Wang D et al. 2020) (Li *et al.*, 2020) (Chen *et al.*, 2020). It has been reported that among men hospitalized with COVID-19 , as much as 79% presented with androgenetic alopecia (AA) (McCoy *et al.*, 2021).

Table 1 presents that COVID-19 patients receiving at the Zahirah General Hospital recover at a higher percentage (76%) than those who die. This indicates that proper patient care management can help decrease the high mortality rate.

Based on the symptoms described in Table 1, it was observed that up to 97 of patients used to have a fever for several days with a temperature above 38^{o}Celsius; this was confirmed by the COVID-19 treatment guidelines, which stated that almost all patients would have a fever above 38^{o}C (Chen *et al.*, 2020) (kemenkes RI, 2020). In addition to fever, the patient also had other complaints such as cough, runny nose and diarrhea, each of which occurred in some patients. These results are similar to symptoms in COVID-19 patients undergoing inpatient treatment at a hospital in Wuhan (China), where the symptoms caused are fever (98.6%) and cough (59.4%) (Wang D et al. 2020) (Li *et al.*, 2020). The appearance of symptoms of fever, cough and runny nose as indicators of infection indicates that the target cells for COVID-19 such as ACE-2 are located in the lower respiratory tract (Huang *et al.*, 2020) and some of the targets of COVID-19 are also weakly expressed in the gastrointestinal tract, namely: small intestine, oral and nasal mucosa and nasopharynx so that some (50%) patients have diarrhea (Hamming *et al.*, 2004).

Immediate treatment of patients with comorbidities is very important, ignoring the side effects of drug administration can worsen the patient's condition. Patients with comorbidities generally will experience more complex symptoms than patients without comorbidities such as the occurrence of blood clots. So that in handling the treatment, anticoagulants must be given, besides that the patient's level of saturation must be overcome so that respiratory failure does not occur due to lack of oxygen levels in the body.

Based on the comorbidities shown in Figure 2, it was found that diabetes (56%) and hypertension (38%) were comorbidities of COVID-19 patients which showed the highest numbers. The elderly who have comorbid diabetes are the conditions that cause the most severe infections and death (Shang *et al.*, 2021). SARS-CoV-2 infection in diabetic patients may trigger higher stress conditions, thereby causing excessive release of cocorticoid hormones and catecholamines, this can lead to increased blood glucose levels and abnormal glucose variability (Wang *et al.*, 2020). High blood glucose levels can trigger chronic inflammation so that it can worsen the infection, so that patients who have a history of comorbid diabetes experience more severe infections.

This is also exhibited in Table 2, where patients with comorbid diabetes had high blood glucose levels. It is suspected that hyperglycemia can mobilize proinflammatory monocytes, triggering a proinflammatory immune response that results in excessive production of proinflammatory cytokines, resulting in a cytokine storm, exacerbating the incidence of COVID-19.

There are currently no drugs available to target appropriate treatment in cases of COVID-19. Therefore, the treatment so far has focused on symptomatic treatment and improvement of the respiratory system. SARS-Cov2 is an RNA virus that can cause respiratory and digestive disorders due to the presence of a receptor (ACE-2) that is specific for Sarscov-2, so it is considered as the entry point for SarsCov-2. ACE-2 is expressed in the epithelial tract of the human respiratory tract as well as in the lung parenchyma (Jia *et al.*, 2005) and some on the surface of cells in the kidneys, blood vessels, heart, and most importantly (Yesudhas, Srivastava and Gromiha, 2021)as well as the small intestine, oral mucosa and nasopharynx (Yuki, Fujiogi and Koutsogiannaki, 2020). Undifferentiated cells expressing ACE2 are much less likely to be infected with SARS-CoV than cells expressing more ACE2 so that patients who are infected generally have a fever that occurs within a few days and does not improve with analgetics (Jia *et al.*, 2005). The administration of drugs to COVID-19 patients in Indonesia is very diverse and changing, including the provision of treatment therapy. Treatment / treatment therapy depends on the patient's condition. Figure 3 shows that there are 3 types of antivirals that are generally used in cases of COVID-19 treatment, namely Oseltamivir, remdesivir and favifiravir, with the most common antiviral therapy using favifiravir with the patent name Avigan reaching 42%. The antivirus used is generally an antiviral that selectively and strongly inhibits the RNA-dependent RNA polymerase (RdRp) of RNA viruses. Antiviral administration is expected to inhibit the growth of the virus in the body.

Avigan (favipiravir) is an antiviral agent that selectively and strongly inhibits the RNA-dependent RNA polymerase (RdRp) of RNA viruses. Favipiravir is an antiviral that is specifically used so far for influenza viruses (Goldhill *et al.*, 2018).

Favipiravir is a nucleoside analogue that is a promising antiviral drug that targets viral RdRP-dependent RNA polymerase (Goldhill *et al.*, 2018). It is intracellular phosphoribosylated to the active form, favipiravir ribofuranosyl-5B-triphosphate (favipiravir-RTP), which is recognized as a substrate by RdRp, and inhibits RNA polymerase activity (Furuta *et al.*, 2013). In this study, all patients were given food supplements, COVID-19 patients with mild cases, the time needed for recovery after giving food supplements without antivirals was generally 5 days (<7 days). For mild to moderate COVID-19 patients, the time to fever and cough relief after favipiravir was significantly shorter than in the covifor group. Consider giving the type of antiviral based on the severity of the cases that occur (mild, moderate, and severe). Cases in the mild category, namely patients with complaints such as fever, mild cough, and other symptoms without comorbidities will receive oseltamivir antiviral therapy for 5 days, some patients also do not receive antiviral therapy. In patients who have moderate severity with patient complaints of fever, cough, colds and the occurrence of anosmia will receive favifiravir antiviral treatment therapy. Patients who have complaints of fever, cough, runny nose and occurrence of anosmia and have comorbidities are categorized as severe severity who will receive remdesivir antiviral therapy with a minimum hospitalization period of > 21 days.

In this study, all COVID-19 patients were given supplements of Vitamin C, Vitamin D, Vitamin B-complex, and Zinc. In addition to vitamins, Acetylcysteine is also given, acetylcysteine is given if there are conditions with abnormal, thick or irregular mucus secretion such as pneumonia, bronchitis, tracheobronchitis, cystic fibrosis, tracheostomy patients, postoperative pulmonary complications, post-traumatic chest conditions and before diagnostic bronchoscopy. to help with mucus blockage.

Vitamin D is an immunomodulatory hormone with anti-inflammatory and antimicrobial effects with a high safety profile (Aygun, 2020). Vitamin D has a protective and therapeutic effect against COVID-19 through its function as an antioxidant that prevents cell membrane damage due to oxidative stress (Aygun, 2020). Vitamin D receptors are expressed in various organs and tissues including the heart, lungs, kidneys, liver, nervous system, intestines, bones, parathyroid glands, cardiovascular system, and myocardium so that with the administration of Vitamin D can prevent multiple organ damage (Aygun, 2020).

Infection causes activation of phagocytes, which release oxidizing agents referred to as reactive oxygen species. Vitamin C is thought to play a role in the process that leads to virus inactivation due to its antioxidant and free radical scavenger effects which have anti-inflammatory properties, affect cellular immunity and blood vessel integrity, and function as a cofactor in the formation of endogenous catecholamines (Wei *et al.*, 2020) thus the potential role of high-dose vitamin C in relieving inflammation and vascular injury in patients with COVID-19 .

Vitamin B complex can regulate the formation of cytokines and mediate interactions with immune cells that are present in pathophysiology and inflammation (Jovic *et al.*, 2020). Vitamin B1 deficiency in the brain induces gene overexpression. Nias, an amide of B3 reduces TNF, IL-6 and IL-1β in stimulating alveolar macrophages and inhibits NF-activation of B. Vitamin B7 as an immunoregulatory vitamin through enzymes(Jovic *et al.*, 2020). Vitamins B6, B12 and Folic Acid play important and complementary roles in both innate and adaptive immune responses. Deficiency of this vitamin can impair immune function. Vitamin B6 reduces the function and proliferation of T-lymphocytes and inhibits the release of cytokines (Jovic *et al.*, 2020) so as to reduce the severity of COVID-19 patients.

Zinc is known to modulate antivirals and regulate the inflammatory response. Zn^{2+} can decrease the activity of angiotensin converting enzyme 2 (ACE 2) and upregulate interferon production and upregulate it. Zn^{2+} has anti-inflammatory activity by inhibiting NF-κB signaling and modulating the regulation of T cell function that may limit cytokine storm in COVID-19 (Skalny *et al.*, 2020).

Based on Figure 2, LOS (Length of Stay) treatment is generally carried out for more than 14 to 21 days. This illustrates the accuracy of handling and treatment of covid cases at Zahirah Hospital that the handling and treatment of covid 19 is carried out for 14≤ days 21 (41%), patients are considered to have passed the virus transmission period even though a small number of complaints caused to patients still exist. Patients with comorbidities generally receive longer treatment than patients without comorbidities.

Laboratory examinations are also carried out routinely and periodically on patients according to the type of disease experienced, laboratory checks that are commonly carried out are current blood sugar levels, hemoglobin, hematocrit, leukocytes, platelets and lymphocytes, this is to see the general condition of the patient in order to get the right treatment. according to the patient's condition. There are several clinical blood profiles that are important to know the patient's clinical picture, such as leukocytes, platelets, hematocrit, etc. There are five types of leukocytes, including neutrophils, eosinophils, and basophils. In addition, laboratory results are also needed to see the clinical picture of the patient. Table 2 shows that almost all COVID-19 patients have decreased levels of lymphocytes, this is indicated by lymphocyte levels that are lower than the normal limit. Lymphocytes are a component of specific immunity. Specific immune response occurs if there is a certain antigen/virus that infects so that the immune system will be stimulated to eliminate the presence of the virus and prevent its spread. Low lymphocyte values (< 25%) indicate the presence of extraordinary infection in the patient, so that it can worse the patient's condition.

CONCLUSION

Profile and clinical character of COVID-19 patients at Zahirah Hospital in Jakarta, based on age, the late elderly had the largest percentage(43%), male had a greater percentage (52%), antiviral drugs were the most widely used in the treatment for COVID-19 patients is Avigan (Favipiravir) (42%), the length of stay of patients is generally 14-21 days (41%)and patients return home recovering and able to carry out their activities as before (76%). Diabetes is the comorbid disease that causes death and the most severe COVID-19 symptoms, and all COVID-19 patients with comorbidities have lower levels of lymphocytes.

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